ORDER NO. AD9101007C2

Service Manual

Professional Digital Audio Tape Deck

SV-3900

Color

(H)...Gray Type

Area

Country Code	Area	Color
(EB)	Great Britain/ Switzerland.	(H)
(EG)	F.R. Germany/Italy/ Continental Europe.	

SPECIFICATIONS

Signal Format

Tape recording system:	Rotary head type DAT
Sampling frequencies:	
For recording:	48 kHz/44.1 kHz (analog/digital input) 32 kHz (digital input only)
For playback:	48 kHz/44.1 kHz/32 kHz (selected automatically)
No. of quantizing bits:	16-bit linear
No. of channels:	2 (stereo)

Audio Parameters (Recording and Playback System)

Frequency response:	
For 48 kHz:	10 Hz~22 kHz (±0.5 dB)
For 44.1 kHz:	10 Hz~20 kHz (±0.5 dB)
Signal to noise ratio: (dynamic range)	Greater than 92 dB, DIN audio weighted (22.4 Hz to 22.4 kHz bandpass)
Total harmonic distortion:	Less than 0.05% (1 kHz, +4 dBu) Less than 0.007% (1 kHz, +22 dBu)
Wow and flutter:	Unmeasurable

General

Power supply:	AC 110 V/127 V/220 V/240 V 50/60 Hz
Power consumption:	35 W
External dimensions: (W×H×D)	43×12.2×31.5 cm
Weight:	6.4 kg

Input/Output Jacks

Analog	
Input jacks:	XLR-3 type
Nominal input level/ Input impedance:	+4 dBu (−18 dB rec level)/ 10 kΩ balanced
Output jacks:	XLR-3 type
Nominal output level/ Output impedance:	+4 dBu/−10 dBu (switch selectable)/ 75Ω balanced
Phones output:	Max. 30 mW/32Ω (matching impedance 8~600Ω)
Digital (AES/EBU type)	
Input jacks:	XLR-3 type/100Ω balanced
Output jacks:	XLR-3 type/20Ω balanced
Digital (IEC TYPE II)	
Input jack:	RCA phono type (coaxial)/75Ω
Output jack:	RCA phono type (coaxial)/75Ω

Remote Control

Parallel remote:	8 pin DIN connector (43 functions available)
Serial remote:	9 pin D-sub connector×2 (for Input and Output) Based on ES-bus and P-2 protocols (switchable) *Controller SH-MK390 (option) is available for ES-bus mode
Machine number setting:	Zero thru No. 31 (available in ES-bus mode)

Mechanism

Heads:	Amorphous ferrite composite type
Cylinder diameter:	30 mm
Cylinder rotation speed:	2000 r.p.m. (recording and playback)
Tape speed:	8.15 mm/sec., 12.225 mm/sec. (selected automatically)
Search speed:	Up to 250 times normal playback speed
FF/Rewind speed:	Up to 400 times nomal playback speed
FF/Rewind time:	Approx. 27 sec. (2 hours DAT tape)

Note:
Specifications are subject to change without notice.
Weight and dimensions are approximate.

Panasonic

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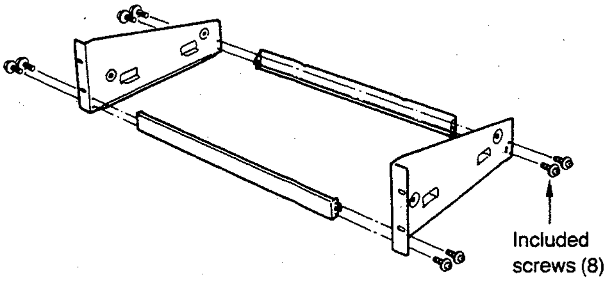
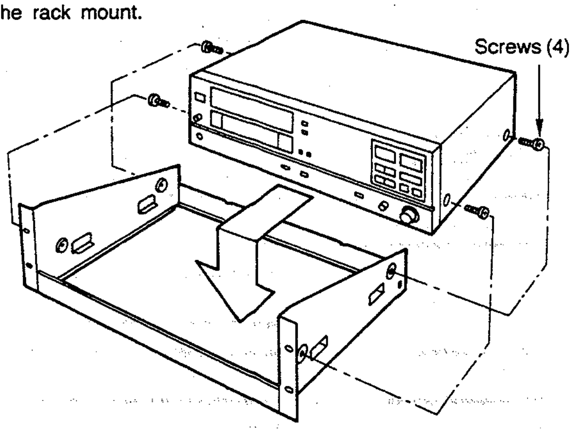
INSTALLATION

Installation of rack mount kit

1. Assemble the rack ears and panel, and tighten with screws included.



2. Remove the 4 screws on side enclosure, and attach the unit to the rack mount.



Notes on placement

- **This unit is a precision instrument. Be sure to place it on a flat surface, or mounted level in a rack.**
- **Avoid places such as the following:**

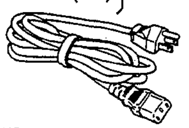
•Near any equipment or device that generates strong magnetic field.
•On any heat-generating equipment or device, or in any place where the temperature is high (35°C/95°F or higher).
•Extremely cold locations (5°C/41°F or below).
•Near an AM/FM tuner or TV.
(It may produce noise in the broadcast audio, or disturb the TV picture.)
•For long periods of time in direct sunlight.
•In dusty or smoky locations.
•In locations prone to vibrations.
•In locations where the rear panel is less than 10 cm (about 4") away from the wall or back of an audio rack.

- **Do not place heavy objects, other than system components, on top of the unit.**
- **When carrying or storing the unit, handle it with care and do not subject to any strong bumps.**
- **To avoid problems due to vibration:**

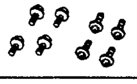
•Do not place a book or similar object under this unit.
•Do not route the connection cables (of this or other units) across the operation panel, across the top, or under the unit.

ACCESSORIES

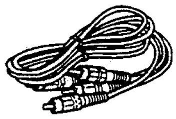
•AC power supply cord 1
(SJAD8 (EB)
RJA0003-K (EG))



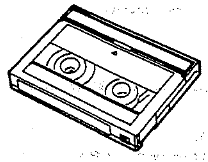
•Screws 8
(XYN3+F10FZ)



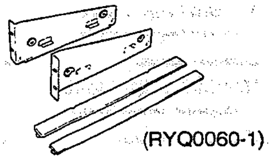
•Coaxial cable 1
(SJPD19-1E)



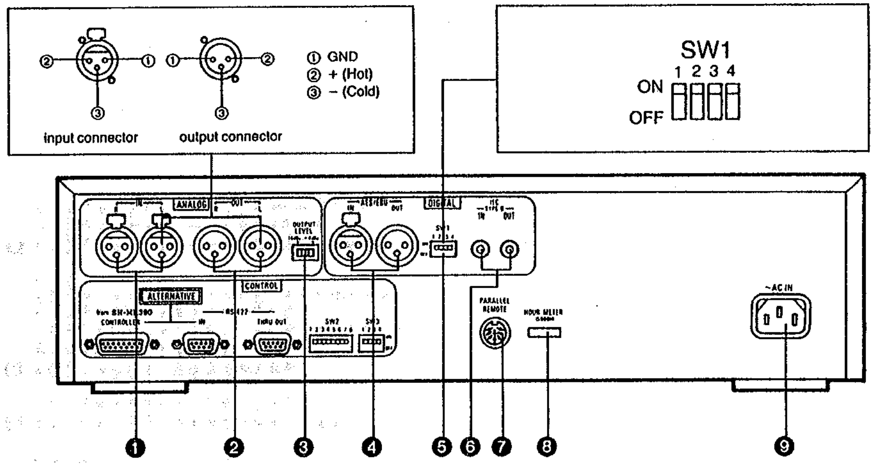
•Cleaning tape 1
(RT-RCLP)



•Rack mount kit 1
(RYQ0059-1)



CONNECTIONS


① GND
② + (Hot)
③ - (Cold)
input connector
output connector
SW1
1 2 3 4
ON
OFF
ANALOG
IN
OUT
OUTPUT LEVEL
AES/EBU
DIGITAL
IEC TYPE II
CONTROL
ALTERNATIVE
RS-422
SW2
SW3
PARALLEL REMOTE
HOUR METER
~AC IN
❶
❷
❸
❹
❺
❻
❼
❽
❾

❶ **ANALOG IN terminals**
These are balanced analog audio XLR input connectors.

❷ **ANALOG OUT terminals**
These are balanced analog audio XLR output connectors.

❸ **OUTPUT LEVEL selector (+4 dBu/−10 dBu)**
Select the nominal output level corresponding to a peak level meter display of −18 dB.

❹ **AES/EBU terminals (IN/OUT)**
These terminals are for input or output of signals via the professional digital interface.

❺ **DIP switch settings (SW1)**
These are used for the following settings:
- •Digital Input Selection (IEC TYPE II or AES/EBU)
- •SCMS ID 6 Status for AES/EBU Input
- •Blank Skip Mode in Program Search Mode

(For further details, see page 6.)

❻ **IEC TYPE II (IEC 958) jacks (IN/OUT)**
These terminals are for input or output of digital signals from/to a consumer unit.

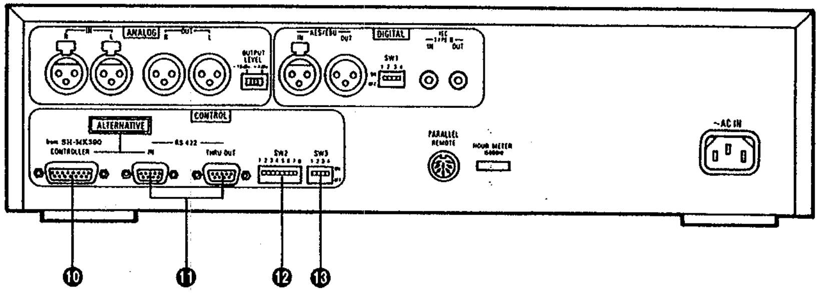
❼ **REMOTE CONTROL jack (PARALLEL)**
See page 28.

❽ **Hour meter (5000H)**
Shows the number of hours of head usage in recording and playback.

❾ **AC IN jack**
Connect to the grounded AC outlet with the AC power supply cord included.

SETTING THE MACHINE NUMBER

Rear panel


ANALOG
AES/EBU
DIGITAL
OUTPUT LEVEL
ALTERNATIVE
CONTROL
from SH-MK390 CONTROLLER
RS-422
IN
THRU OUT
SW2
SW3
PARALLEL REMOTE
HOUR METER
~AC IN
❿
⓫
⓬
⓭

❿ **Dedicated remote controller connector**
This is a 15-pin serial connector used to connect an optional dedicated remote controller (SH-MK390).

⓫ **Bus (RS-422) connectors**
These two 9-pin connectors are used to connect the deck to a serial bus, or a computer.
Connect it using only an RS-422 type cable.

Note:
This connector cannot be used to simultaneously connect the deck to a dedicated remote controller and a computer.

⓬ **DIP switch settings (SW2)**
These are used for the following settings:
- •Machine Number Selection
- •Device Type Selection
- •Test Mode Selection

(For further details, see page 6.)

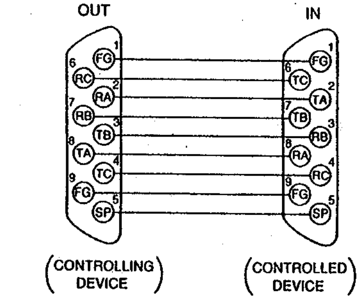
⓭ **DIP switch settings (SW3)**
These are used for the following settings:
- •Maximum Search Speed Selection
- •Protocol Selection
- •Data Transmission Speed Setting

(For further details, see page 6.)

ES Bus

This format was developed jointly by the EBU (European Broadcasting Union) and the SMPTE (Society of Motion Picture & Television Engineers) for remote control of recording, production and broadcasting equipment.
The controller sends control messages along a serial bus, hence the cable connection is simple. This enables various equipment connected to the bus to be selected and controlled individually or collectively.
ES bus, Messages specific to a DAT (commands and responses) are not yet standardized. Hence the deck transmits messages in an escape mode in which messages specific to the deck can be defined. The mechanical and electrical interfaces of this deck are based on RS-422 D sub connector.

The pin connections are shown below.


OUT
IN
FG
RC
RA
RB
TB
TA
TC
FG
SP
FG
TC
TA
TB
RB
RA
RC
FG
SP
1
2
3
4
5
6
7
8
9
CONTROLLING DEVICE
CONTROLLED DEVICE

CONNECTOR PIN ASSIGNMENT

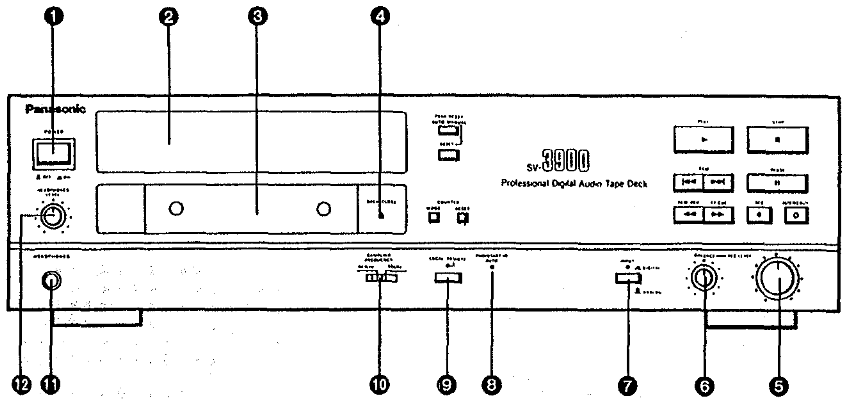
FG: Frame ground	RC: Receive-signal common
RA: Receive "A"	RB: Receive "B"
TB: Transmit "B"	TA: Transmit "A"
TC: Transmit-signal common	
SP: Spare	

P-2 Serial

P-2 is an abbreviation of Protocol-2, which is a serial transmission protocol employing a 9-pin D sub connector. It is at present widely used as a control format between a VTR and a controller.
In this format, one VTR is connected to a single control input/output connector (9-pin D sub connector) of the controller.
ES bus and P-2 protocol can be selected by means of a DIP switch.

■LOCATION OF CONTROLS

Front panel



① **POWER switch (POWER)**

② **Display panel**
See page 5.

③ **Cassette holder**

④ **OPEN/CLOSE button (⏏ OPEN/CLOSE)**

⑤ **REC LEVEL control (REC LEVEL)**
Use to adjust the recording level of both left and right channels.

⑥ **REC BALANCE control (BALANCE)**
Use to adjust recording balance between left and right channels.

⑦ **INPUT selector button/indicator (INPUT)**
Use to select digital or analog recording input.

⑧ **PNO/START ID AUTO indicator (PNO/START ID AUTO)**
Indicates that the unit is set in the automatic mode for recording Program Number and Start ID.
The default mode on power up is set to off (manual recording mode).

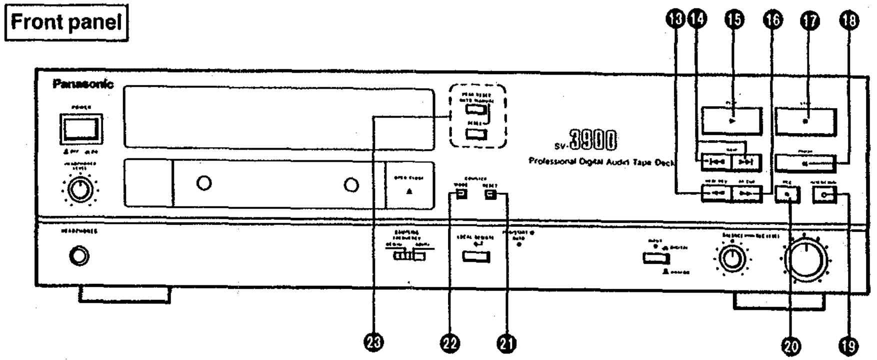
⑨ **LOCAL/REMOTE button (LOCAL/REMOTE)**
Use to select local or remote operating mode.
The default setting on power up is the remote mode.

⑩ **SAMPLING FREQUENCY selector**
Select the sampling frequency when making analog recordings (44.1 kHz or 48 kHz).

⑪ **Phones jack (HEADPHONES)**
A ¼" connector for connecting standard stereo headphones.

⑫ **Phone level control (HEADPHONES LEVEL)**
Use this control to adjust output level to the headphones.

Front panel



⑬ **REW/REV button (◀◀ REW/REV)**
Use to rewind the tape, or for audible high-speed search in play mode (review).

⑭ **SKIP buttons (⏮·⏭ SKIP)**
Use the skip buttons to advance to the desired program.
The ⏭ button skips the program forward by one Start ID.
The ⏮ button skips the program backward by one Start ID.
Repeated pressing of the Skip buttons causes the unit to skip forwards or backwards several IDs.

⑮ **PLAY button/indicator (▶ PLAY)**
Use to initiate recording or playback mode.
Also used to record program numbers manually.

⑯ **FF/CUE button (▶▶ FF/CUE)**
Use to advance the tape rapidly, or for audible high-speed search in play mode (cue).

⑰ **STOP button (■ STOP)**
Use to stop all functions.
This button also clears the program memory.

⑱ **PAUSE button/indicator (❚❚ PAUSE)**
Use to temporarily interrupt playback or recording mode.

⑲ **AUTO REC MUTE button (○ AUTO REC MUTE)**
Use to automatically insert a silent passage approximately four seconds long during a recording.

⑳ **RECORD button/indicator (● REC)**
Use to place the unit in record standby mode.

㉑ **COUNTER RESET button (COUNTER RESET)**
Use to reset the tape counter to "0000" (when the display *mode is set to tape counter).*

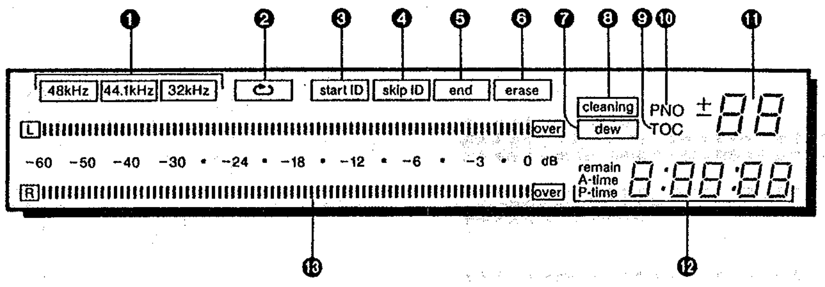
㉒ **COUNTER MODE button (COUNTER MODE)**
Use to select the desired counter mode, between Absolute time, Program time, Time Remaining, TOC and Tape Counter.

㉓ **PEAK RESET buttons (PEAK RESET AUTO/MANUAL/RESET)**
The AUTO/MANUAL button is used to select the peak hold reset mode, auto or manual.

AUTO:	The peak level of the source is held and displayed for approximately one second before being extinguished.
MANUAL:	The peak level of the source is held and displayed continuously until the RESET button is pressed.

The RESET button is used to reset the peak hold display in manual mode.
The default setting on power up is auto mode.

Display panel



❶ **Sampling frequency indicators**
Displays sampling frequency of digital signals during recording or playback.
Changes automatically depending on input or output signal.

❷ **Repeat indicator**
This indicator is used for repeat loop-play function.
Indicates that all programs or memorized programs can be played back repeatedly (⮌).

❸ **[start ID] indicator**
Indicates that a Start ID is being or has been recorded.

❹ **[skip ID] indicator**
Indicates that a Skip ID is being or has been recorded.

❺ **[end] indicator**
Indicates that an End Mark is being or has been recorded.

❻ **[erase] indicator**
Indicates that a Start ID or Skip ID is being erased.

❼ **[dew] indicator**
Indicates the formation of dew within the unit.

❽ **[cleaning] indicator**
Indicates that the DAT head assembly needs cleaning. (See page 8, 10.)

❾ **TOC (table of contents) indicator**
Indicates the total program count and tape length of a commercial tape onto which the TOC information has been recorded.

❿ **PNO (program number) indicator**
Indicates the number of the current program.

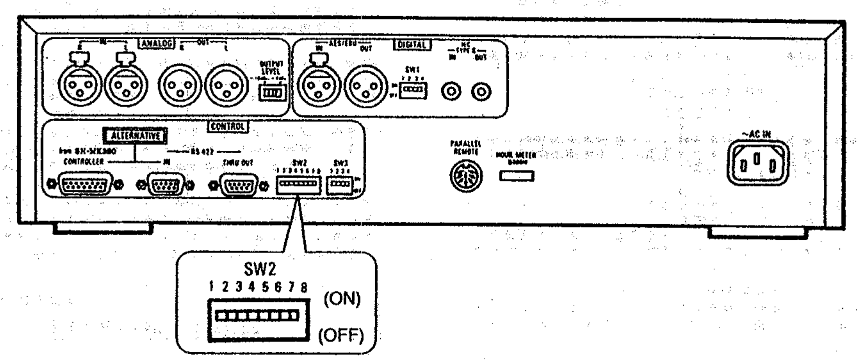
⓫ **Program number display**
Displays either the TOC information (when TOC indicator appears) or the number of the program (when PNO indicator appears).

⓬ **Counter display panel**
The following are displayed according to the setting of the counter mode button:
1) Absolute time
(This display is the default setting when power is first switched on.)
2) Program time (elapsed time since the last Start ID was encountered)
3) Remaining time (approximate time, in hours and minutes to the end of the DAT cassette)
4) TOC information
5) Tape counter

⓭ **Peak level meter**
Recording and playback levels are indicated by a bar graph. Standard I/O level of +4/−10 dBu is shown at −18 dB.

■ SETTING THE MACHINE NUMBER

Rear panel



For Network Control via ES Bus, the machine number of this deck can be set by using rear-panel DIP switch 2.
The machine number is required to identify each deck when the RS-422 connectors of several SV-3900s are connected serially, and selected deck needs to be controlled in the ES bus mode. By using the optional SH-MK390 remote controller, a number of decks can be controlled via the ES bus.

Set the machine number using DIP switches 2-1 thru 2-5 while referring to the table at right.

CAUTION!
Do not specify the same machine number as that of another deck already connected to serial controller.
Switch OFF the power before setting the machine number. If you set the machine number with the power ON, switch the power OFF then ON again to reset the machine value.

Checking the machine number

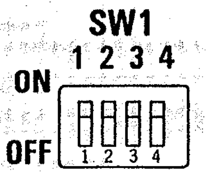
The SV-3900's machine number will appear on the counter display panel as shown below when either the cassette holder is opened, or the cassette holder is closed without loading a cassette tape.

(UP=ON=1, DOWN=OFF=0)

Machine No.	DIP SW2 settings 1	2	3	4	5
00	0	0	0	0	0
01	1	0	0	0	0
02	0	1	0	0	0
03	1	1	0	0	0
04	0	0	1	0	0
05	1	0	1	0	0
06	0	1	1	0	0
07	1	1	1	0	0
08	0	0	0	1	0
09	1	0	0	1	0
10	0	1	0	1	0
11	1	1	0	1	0
12	0	0	1	1	0
13	1	0	1	1	0
14	0	1	1	1	0
15	1	1	1	1	0
16	0	0	0	0	1
17	1	0	0	0	1
18	0	1	0	0	1
19	1	1	0	0	1
20	0	0	1	0	1
21	1	0	1	0	1
22	0	1	1	0	1
23	1	1	1	0	1
24	0	0	0	1	1
25	1	0	0	1	1
26	0	1	0	1	1
27	1	1	0	1	1
28	0	0	1	1	1
29	1	0	1	1	1
30	0	1	1	1	1
31	1	1	1	1	1

■ DIP SWITCH SETTINGS

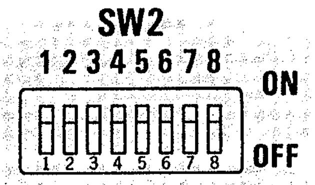
DIP Switches on the Rear Panel



The following settings can be made by using DIP switch 1.

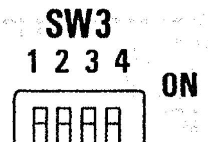
	Switch Setting	Function
1	Digital Input/Output Selection	ON=IEC 958 OFF=AES/EBU
2 3	SCMS ID6 Status for AES/EBU Input	*SW2* *SW3* *ID* *Meaning* OFF — 00 Copy Free ON OFF 10 No further copies ON ON 11 One copy allowed
4	Blank Skip Mode in Program Search	ON=1 OFF=0 SV-3900 will advance to the next selection during Program Play mode, if approximately two seconds of silence are encountered.

Note:
IEC 958 is shown as IEC TYPE II on the rear panel of SV-3900.



The following settings can be made by using DIP switch 2.

	Switch Setting	Function
1 2 3 4 5	Machine Number	For details on how to set the machine number, see page 10.
6 7	Device Type Setting	*SW6* *SW7* *Device* OFF OFF SV-3900 OFF ON MII VCR ON ON SONY VCR
8	Test Mode	OFF=Normal mode ON=Test mode



The following Settings can be made by using DIP switch 3.

	Switch Setting	Function
1	Maximum Search Speed	OFF=Max. 250 times search speed possible ON=Max. 400 times search speed possible
2	Serial Protocol	OFF=ES BUS ON=P2
3 4	Data Transmission Speed	*SW3* *SW4* *Transmission speed* OFF OFF 38.4 kbps ON OFF 9600 bps OFF ON 4800 bps ON ON 2400 bps

SCMS Copy Protection

The Serial Copy Management System (SCMS) is designed to control digital-to-digital DAT copying that a consumer can perform on various digital audio material, including Compact Discs, pre-recorded DAT tapes, and other material via IEC 958 "consumer use" digital audio interfaces (also commonly referred to as "S/P DIF" and EIAJ CP-340). SCMS does not affect the ability to make copies using a DAT recorder's analog inputs and outputs, nor does it apply to digital-to-digital copies made via the AES/EBU professional digital audio interface.

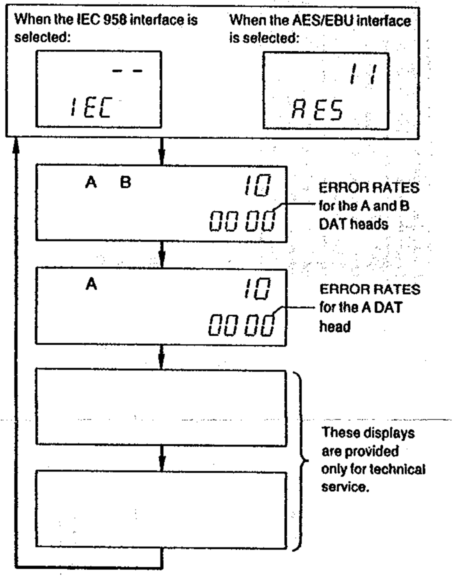
Only one serial (or generational) digital-to-digital copy can be made from a copyright protected source, such as a commercial CD or pre-recorded DAT. Serial Copy Management System labels are generated onto tape each time an SCMS-equipped consumer DAT machine records an audio signal to tape, no matter whether the source is from the analog or digital inputs.

Technically, the SCMS labels for DAT are encoded into the SubCode sections of the main digital data area, specifically "ID6". The SV-3900's rear-panel DIP switches allow the user to preset the SCMS status bits of ID6 onto the DAT recording. For legal reasons, the ID6 bits are only modified if the source input is the AES/EBU Digital I/O; during digital copying via the IEC "consumer use" input, the SV-3900 simply copies across the current status of SCMS codes indicated by the Channel Status. To prevent a master DAT tape being copied on a consumer deck, for example, the user might select switch setting for "ID6=10", which would prevent any further digital copying of this copyrighted cassette via a consumer DAT. Alternatively, you might select "ID6=00", so that any number of digital copies could be made on a consumer deck. Selection of "ID6=11" will designate a final copyright protected pre-recorded product, which would behave the same way on consumer SCMS-equipped DAT decks as a normal commercial release.

DISPLAYING SCMS STATUS AND ERROR RATES

The SCMS status of a DAT recording can be displayed on the SV-3900 by simultaneously pressing the front-panel COUNTER MODE, RESET and PAUSE buttons. Now shown within the normal Time Display window will be the type of digital interface that has been selected via the rear-panel DIP switch—AES/EBU or IEC 958 "consumer use"—while the PNO display now shows the ID6 value of the recording: 00, 10 or 11. If the COUNTER MODE button is pressed for a second time, the SV-3900 will display ERROR RATES; the mode can be cancelled by hitting the RESET button.

Each time the COUNTER MODE button is pressed, the display changes as follows:


When the IEC 958 interface is selected:
When the AES/EBU interface is selected:
--
IEC
11
AES
A B
10
00 00
ERROR RATES for the A and B DAT heads
A
10
00 00
ERROR RATES for the A DAT head
These displays are provided only for technical service.

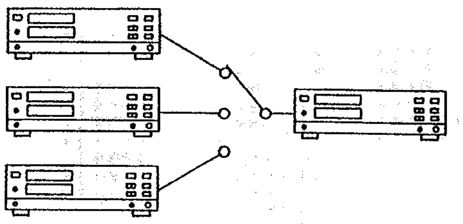
Note:
The display scheme described above will not be shown, when the machine number is being displayed.

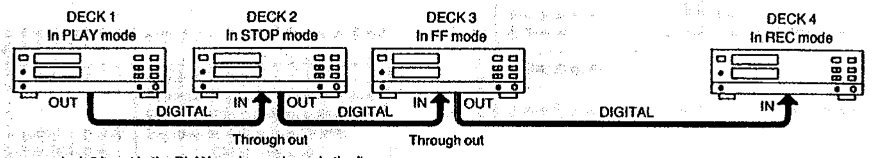
■DIGITAL THROUGH PUT FUNCTION

A special function provided on the SV-3900 Pro-DAT enables up to five machines to be connected together in a serial mode, whereby the digital output from any single machine on the network can be recorded onto a master SV-3900. In this way, a network array can be set up for digital dubbing and insert-editing between several replay DATs and a master recorder. For such applications as automated replay for broadcast or permanent-sound systems, a series of SV-3900s can be controlled from an external computer or SH-MK390 Remote Controller, to form a multi-machine replay system with a common digital or analog output. The digital input to any machine in the network that has been set to Digital Through Put mode will be automatically routed to its digital output. In replay mode, however, the selected SV-3900 will output directly onto the digital buss, and hence to the master or replay unit.

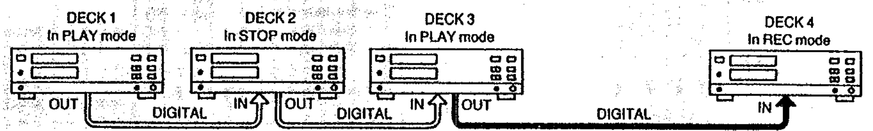
The attached figure shows a typical set up. Machine #1 is connected via its AES/EBU digital output to the AES/EBU input of machine #2, and so. The last machine on the network, designated here as Machine #4, is set to Record Standby mode, with its input also set to AES/EBU digital I/O. The output from any low-numbered machine will be overridden by a machine that is connected between it and the master SV-3900 deck.

Note:
This function will not work unless the decks are connected digitally.





If, however, deck 3 is put in the PLAY mode, as shown in the figure, the playback signals from deck 3 will be input to deck 4.



The digital signal from DECK 1 cannot be through put, because DECK 3 is in play mode.

Notes:
- The digital through put function is not activated when the SV-3900 is first powered up.
- When selecting the digital through put function, use the AES/EBU ports to connect digital signals. A maximum of five decks can be connected serially in this way.
- Use this digital through put function when using the SH-MK390 optional remote controller to perform program playback and program editing between a number of decks.

To initiate the Digital Through Put Function

1 **Open the cassette drawer (select Local mode if necessary).**

2 **Press the RECORD button.**
The Sampling Frequency indicator will now flash, indicating the Digital Through Put mode has been established. The SV-3900 will continue to respond normally to all transport controls. If the Play button is pressed, however, the output of the selected SV-3900 will pass directly via the Network Digital Buss to the master machine.

To cancel the Digital Through Put Function

1 **Open the cassette drawer (select Local mode if necessary).**

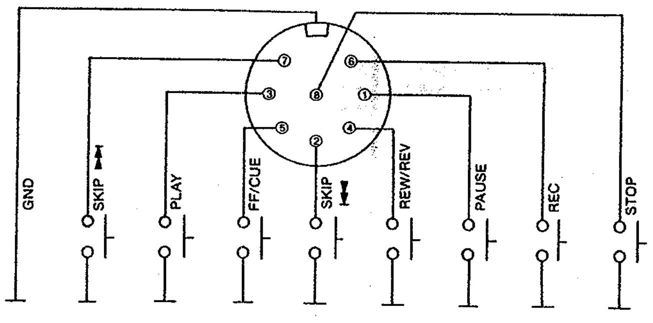
2 **Press the AUTO REC MUTE button.**
The Sampling Frequency indicator will now cease to flash, indicating the Digital Through Put mode has been cancelled.

■REMOTE CONTROL

This unit has three systems for remote control operation, using the optional SH-MK390 remote controller, the RS-422 serial remote control, and the 8-pin parallel input terminal.

Parallel Input Terminals

By connecting the following circuits, the SV-3900 can be operated by remote control using normal switches. This remote control operation functions in the Local mode only.



Expansion function

Connected via the Parallel Input Terminal to computer, the signals shown in the table below can be used to control the following 43 functions.

FUNCTION	DIN Jack Number								FUNCTION	DIN Jack Number							
	3	2	5	8	7	4	6	1		3	2	5	8	7	4	6	1
PAUSE	1	1	1	1	1	1	1	0	1	0	0	0	1	0	0	0	0
REC	1	1	1	1	1	1	0	1	2	0	0	0	1	0	0	0	1
REW	1	1	1	1	1	0	1	1	3	0	0	0	1	0	0	1	0
FWD SKIP	1	1	1	1	0	1	1	1	4	0	0	0	1	0	0	1	1
STOP/CLEAR	1	1	1	0	1	1	1	1	5	0	0	0	1	0	1	0	0
FF	1	1	0	1	1	1	1	1	6	0	0	0	1	0	1	0	1
REV SKIP	1	0	1	1	1	1	1	1	7	0	0	0	1	0	1	1	0
PLAY	0	1	1	1	1	1	1	1	8	0	0	0	1	0	1	1	1
(NO. KEY)	1	1	1	1	1	1	1	1	9	0	0	0	1	1	0	0	0
OPEN/CLOSE	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	1
AUTO REC MUTE	0	0	0	0	0	0	1	0	ID-ERASE	0	0	1	0	0	0	0	0
FADE IN	0	0	0	0	0	0	1	1	RENUMBER	0	0	1	0	0	0	0	1
FADE OUT	0	0	0	0	0	1	0	0	SKIP PLAY/OFF	0	0	1	0	0	0	1	0
COUNTER RESET	0	0	0	0	0	1	0	1	AUTO PNO/OFF	0	0	1	0	0	0	1	1
COUNTER MODE	0	0	0	0	0	1	1	0	MUSIC SCAN	0	0	1	0	0	1	0	0
MEMORY	0	0	0	0	1	0	0	0	DIRECT REC PAUSE	0	0	1	0	0	1	0	1
END SEARCH	0	0	0	0	1	0	1	0	DIRECT REC PLAY	0	0	1	0	0	1	1	0
REPEAT	0	0	0	0	1	0	1	1	UNLOAD	0	0	1	0	0	1	1	1
START-ID	0	0	0	0	1	1	0	0	ST-ID WRITE	0	0	1	0	1	0	0	0
SKIP-ID	0	0	0	0	1	1	0	1	SK-ID WRITE	0	0	1	0	1	0	0	1
END-ID	0	0	0	0	1	1	1	0	ST-ID ERASE	0	0	1	0	1	0	1	0
ID-WRITE	0	0	0	0	1	1	1	1	SK-ID ERASE	0	0	1	0	1	0	1	1

(ON=0, OFF=1) (ON=0, OFF=1)

Serial remote control using RS-422 ports

You can transmit messages (commands and responses) to and from the SV-3900 via the RS-422 interface (9-pin D-sub connector). Message transfer is based on switchable ES bus or P2 protocols; see page 6 for more details.
Messages specific to a DAT (commands and responses) have not yet been standardized. By developing suitable software to run on a conventional PC or terminal, it is possible to create an automatic system that can control the SV-3900 in a variety of applications.

■OPERATION NOTES

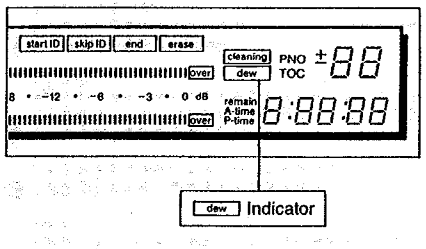
Condensation

In winter, moisture droplets may form on the window panes of a heated room. This phenomenon is called condensation. Condensation may occur with this unit or with cassette tape in the following situations:
- in a room where a heater has just been turned on
- in a room where steam or excessive moisture are present
- when the unit is brought in suddenly from a cold place to a warm room
- when the unit is directly in the path of cold air from an air conditioner, etc.

In such cases, the unit will not operate correctly, and even if it does operate, the tape may be damaged.
In particular, if moisture condenses on the rotating heads, the tape will stick. This will prevent the tape from running properly, and could damage it.

If Condensation Occurs

To protect the tape, this unit contains a built-in device so that when condensation occurs, the dew indicator on the display panel flashes. While the dew indicator is flashing, apart from the OPEN/CLOSE function, buttons on the unit will not operate.



If a cassette tape is loaded in the unit, remove it and leave the power switched on. Wait until the indicator goes out. The time required for moisture to evaporate will vary according to the environment, but it may be 60 minutes or longer if humidity is high. Condensation usually sets in gradually, so the indicator may not flash for the first 10~15 minutes. If room temperature or humidity changes abruptly, therefore, wait for about 20 minutes before switching on power to check that the indicator is not flashing.

Unloading Function

If the unit is in the stop, pause or record standby modes for more than 12 hours the cassette tape will be released automatically from the rotating head mechanism.

Operating the Unit

■ **Always keep the cassette holder closed.**
If it is left open, dust will accumulate in the mechanism and cause tape playback or recording performance to deteriorate. Do not touch the inside of the cassette holder.

■ **If the unit is not used for extended periods, remove the cassette tape.**

■ **The top of the deck will become hot during use, but this is perfectly normal.**

■ **Keep the replay volume low.**
With DAT (Digital Audio Taperecorder) cassettes, there is much less noise than with compact cassettes and a wider dynamic range.
There will be a sudden burst of sound when the audio material begins. As this may damage the speakers, due care should be taken.
Be especially careful when using headphones.

※Dynamic Range
Dynamic range is the difference between the lowest sound level and highest sound level, and is expressed in decibels (dB). The greater this difference, the more dynamic the recording.

■ **When carrying or storing the unit, take care not to subject it to any severe shocks.**
When storing or transporting the unit, also be sure to remove the cassette tape.

Recording of Program Numbers

- During automatic or manual recording of program numbers, a start ID of 9 seconds duration is recorded each time a program number is recorded.
- Some compact discs have a very short interval between sections. Even in these cases, however, if your CD player has an auto space function, the space between musical sections can be set automatically so that program numbers are entered correctly during recording.

When Making Digital IN/OUT Connections

If the connections to the following equipment are set incorrectly, a loop may be set up where the output of the unit is connected to its recording input. This will not only set up an oscillation but may also damage the monitor speakers. Attention should therefore be paid to the following points:
1) When recording or playing back through the unit's DIGITAL IN/OUT terminals, be sure to connect these terminals to the DIGITAL PLAYBACK (IN)/DIGITAL REC OUT (OUT) terminals of other equipment.
2) If the monitor amplifier has no DIGITAL PLAYBACK OR DIGITAL REC OUT terminals, this DAT deck can be used only for playback through the ordinary DIGITAL INPUT terminals on the amplifier.
3) If connections are made as in 2) and it is desired to record, do not on any account set the INPUT SELECTOR of the amplifier to "DIGITAL".

■MAINTENANCE

To clean this unit, use a soft, dry cloth. If the surfaces are extremely dirty, use a soft cloth, dipped into a soap-and-water solution or a weak detergent solution. Wring the cloth well before wiping the unit. Wipe once again with a soft, dry cloth.
Never use alcohol, paint thinner, benzine, nor a chemically treated cloth to clean this unit.
Such chemicals may damage the finish of your unit.

Importance of Cleaning DAT Heads

As with any tape-based recorder, it is essential that the SV-3900 Pro-DAT's heads are kept perfectly clean. A Panasonic DAT Head Cleaning Tape (part number RT-RCLP, included) is available for your local dealer that automatically removes the dirt, dust and shed tape particles that gradually build up on the DAT heads.

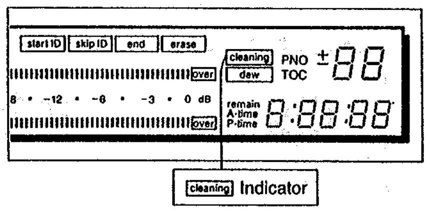
But how do you know that the heads need cleaning? In extreme conditions the audio output will mute, but long before that happens, the slow build up of dirt and oxide will "mask" the sound, and diminish the full 16-bit audio quality from this DAT machine by causing record as well as replay errors.

An ideal solution is to make yourself a "DAT Test Tape" whose error rate you can monitor on a daily or weekly basis (depending on how often you use the SV-3900). To prepare a Test Tape, first select a high-quality DAT cassette and then record a series of music selections. Rewind the DAT cassette and monitor the Error Rates during the first several minutes of tape.

Panasonic brand DAT tapes use high-quality formulations, binders, backings and calendaring process, to provide minimum abrasiveness with maximum stability of metal particles on the tape. It is specifically designed to maximize head life of your DAT machine.

Check the Error Rates at several points in the tape and average the values. (For details of how to display error rates on the SV-3900, see page 27.) If the Error Rates increase to around 300, a Panasonic Head Cleaner Tape can be used as follows: Play the cleaning tape through the SV-3900 for approximately 15 seconds, and remove it. DO NOT REWIND the cleaning tape, since this action might very well spread previously removed dirt and dust onto an otherwise clean head and transport. After the Head Cleaner Tape has been used up, dispose of it properly and start to use a new one.

If the DAT heads become very contaminated with dirt and dust, the CLEANING indicator within the display panel will flash. In this case, use a Head Cleaner Tape as described above.



- If playback quality improves after cleaning, but then deteriorates immediately after recording or playing back several times, the cassette tape has probably reached its useful lifetime. In this case, use a new tape.
- If sound quality does not improve even after cleaning, consult your dealer.
- Cleaning tapes cannot be used for recording or playback (be sure to read also the operating instructions supplied with the tape).

■ SV-3900 DAT MAINTENANCE CHART

• REGULAR MAINTENANCE

The purpose of periodic maintenance as recommended is to keep the equipment in the best possible operating condition throughout its useful life. Observance of this maintenance schedule ensures that maximum performance and reliability is obtained from the machine.

Regular maintenance is necessary because the DAT Recorder is a high-technology piece of equipment, containing DC motors, head cylinder assemblies, and a complex mechanism. These components deteriorate over time. Dust and dirt can clog the head gap, which affects the sound. In light of this, it is very important that overall maintenance be performed according to the maintenance chart to avoid problems resulting from heavy image. Maintenance should also be performed after any repairs on the equipment.

Maintenance is particularly recommended for DAT Recorders used in commercial and broadcast applications for serveral reasons. Installation and application are frequently under less than ideal conditions, such as long usage times and poor environmental conditions. All of this adversely affects the life span and performance of the machine. Regular maintenance assures that the purchaser obtains maximum value for this expenditure.

Note: Refer to the hour meter to know when to perform the maintenance.

Part Name	Part Number	500	1000	1500	2000	2500	3000	3500	4000	4500	5000
Upper Cylinder	VEH0460	○	●	○	●	○	●	○	●	○	●
Cylinder Unit	VEG0752	○	○	○	○	○	○	○	○	○	●
S. Load Arm Ass'y	RXL0052										●
T. Load Arm Ass'y	RXL0054										●
Load Cam	RDK0006-1						●				
Capstan Unit	REM0001	○	○	○	○	○	○	○	○	○	●
Post Roller	RXP0008	○	○	○	○	○	○	○	○	○	●
Guide Roller	RXP0027	○	○	○	○	○	○	○	○	○	●
Pinch Roller	1NB0001ZA	○	○	○	○	○	●	○	○	○	○
S. Reel Ass'y	RXR0006										●
T. Reel Ass'y	RXR0007										●
BT Lever	RXL0048										●
Tension Band Ass'y	RXL0036						●				
S. Brake Ass'y	RXL0049						●				
T. Brake Ass'y	RXL0050						●				
Idler Gear	RDG0071										●
Mode Motor Ass'y	REM0009								●		
Mode Cam	RDK0007-1										●
M Gear B	RDG0067										●
Drive Gear Ass'y	RXG0011						●				
Idler Gear (F)	RDG0069										●
Idler Gear (P)	RDG0068										●
Mode SW Ass'y	RES0002						●				
Load SW Ass'y	RES0001										●
Cassette SW	EVQWR4002										●
Earth Terminal	RUS740ZA										●
Loading Motor	MMN-6FBRC8S										●
Belt	SMQ20025										●
Leaf SW	SSPD18										●

● Replacement, ○ Cleaning

• DAT Head and Tape Transport Cleaning

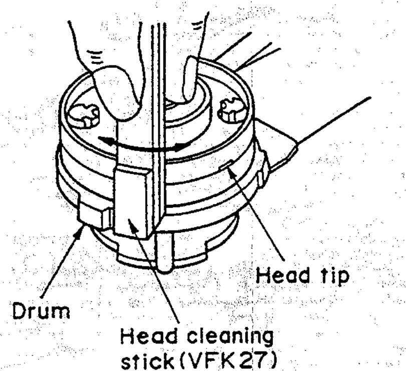
Through normal usage of any tape machine, dirt and debris from the tape accumlates on the heads, which eventually causes performance problems. By using a cleaning cassette regulary, dirt buildup can be minimized, prolonging the life of the tape heads, and also keeping tape posts, tape guides, and the pinch roller clean.

• CLEANING

1. Play the cleaning cassette (Panasonic Part No. RT-RCLP) for 15-20 seconds.
2. Do not use the same part of the cleaning tape more than once.
3. Clean all tape contact surface, including A/C head upper and lower drum, thoroughly with a soft cloth soaked in alcohol.
4. Clean both heads by gently rubbing in a horizontal direction, as depicted, using a head cleaning stick (VFK27) or a lint free cloth moistened with alcohol.
5. Wipe all tape contact surfaces, including upper and lower drum, with a dry soft cloth to ensure that all residual moisture is removed from the tape contact surfaces.

Note:

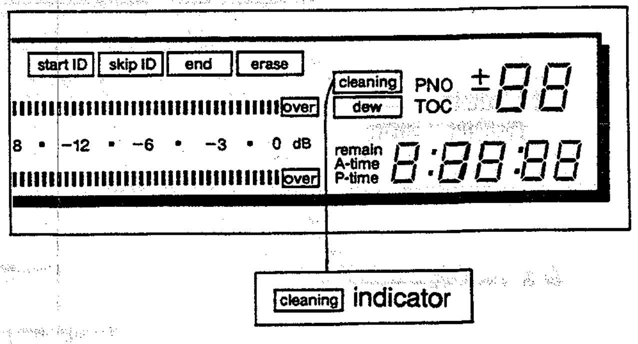
1. When cleaning the upper drum, hold it secure with your finger tips.
2. Use solvents sparingly, excess alcohol will dilute and remove the bearing lubricant in the capstan motor and rotary guides.
3. Do not, under any circumstances, insert any object into the head tip slot of the head cylinder.



• IMPORTANT

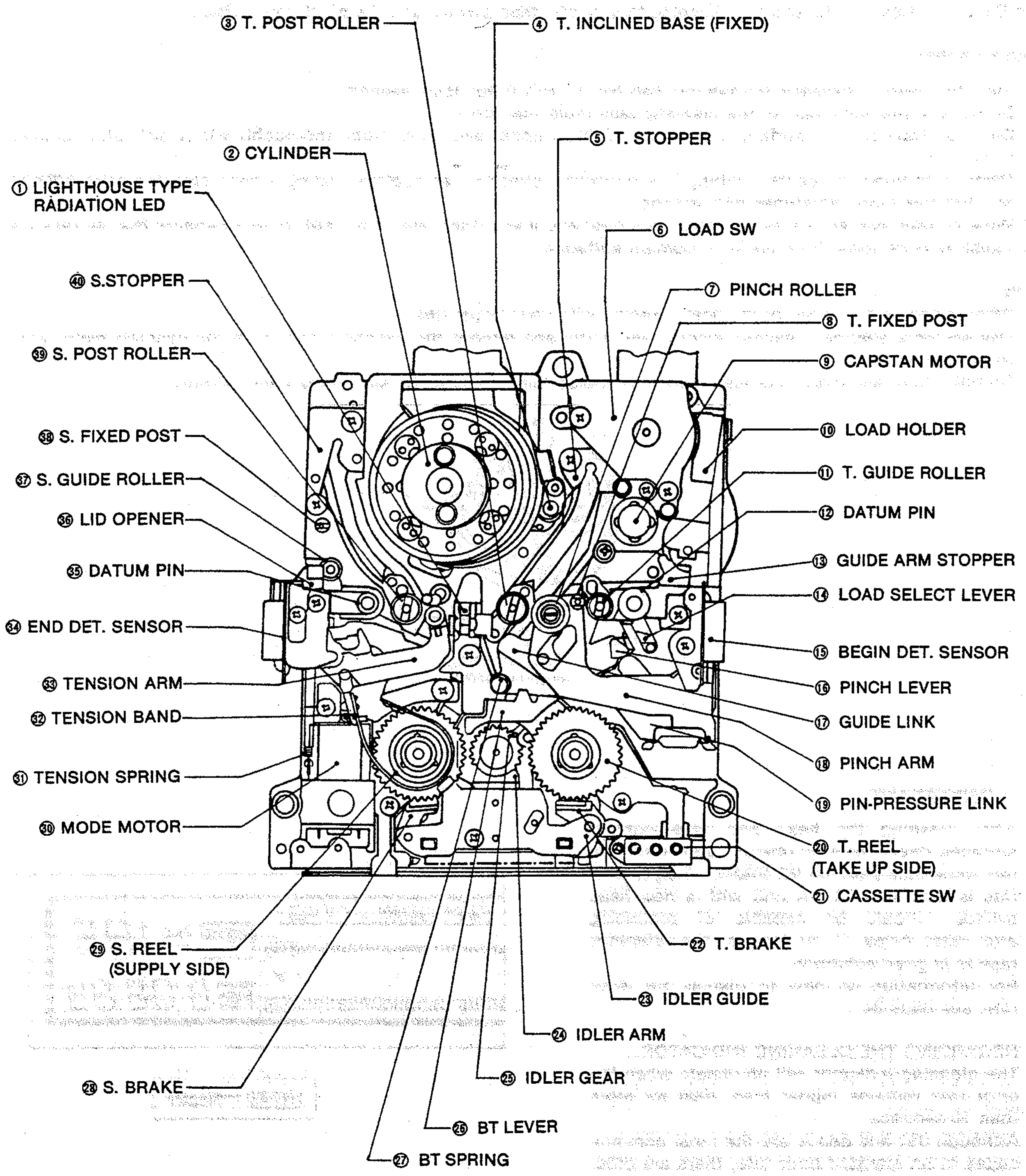
After cleaning the head and tape contact surfaces, check the error rate using the error rate reference tape (Part No.RD-ER01). Target error rate is less than 50. A unit with a new head cylinder should be capable of producing error rates below 10, as long as the reference tape is in good condition.
For information on how to display the error rate, see page 84.

REGARDING THE CLEANING INDICATOR...
The cleaning indicator will illuminate when the error rate remains higher than 1000 for more than 10 seconds.
Although dirt and debris are the most common cause of an elevated error rate, there are other conditions that may cause it. Therefore, do not assume that a cleaning indication means that the head is dirty.

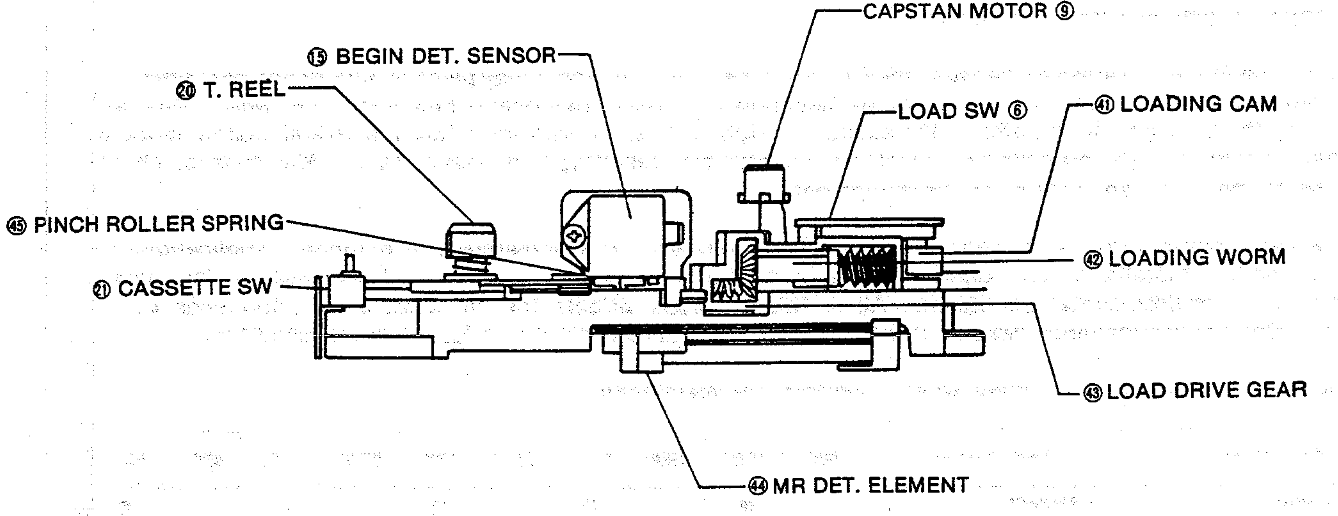


• MECHANISM COMPONENT LAYOUT

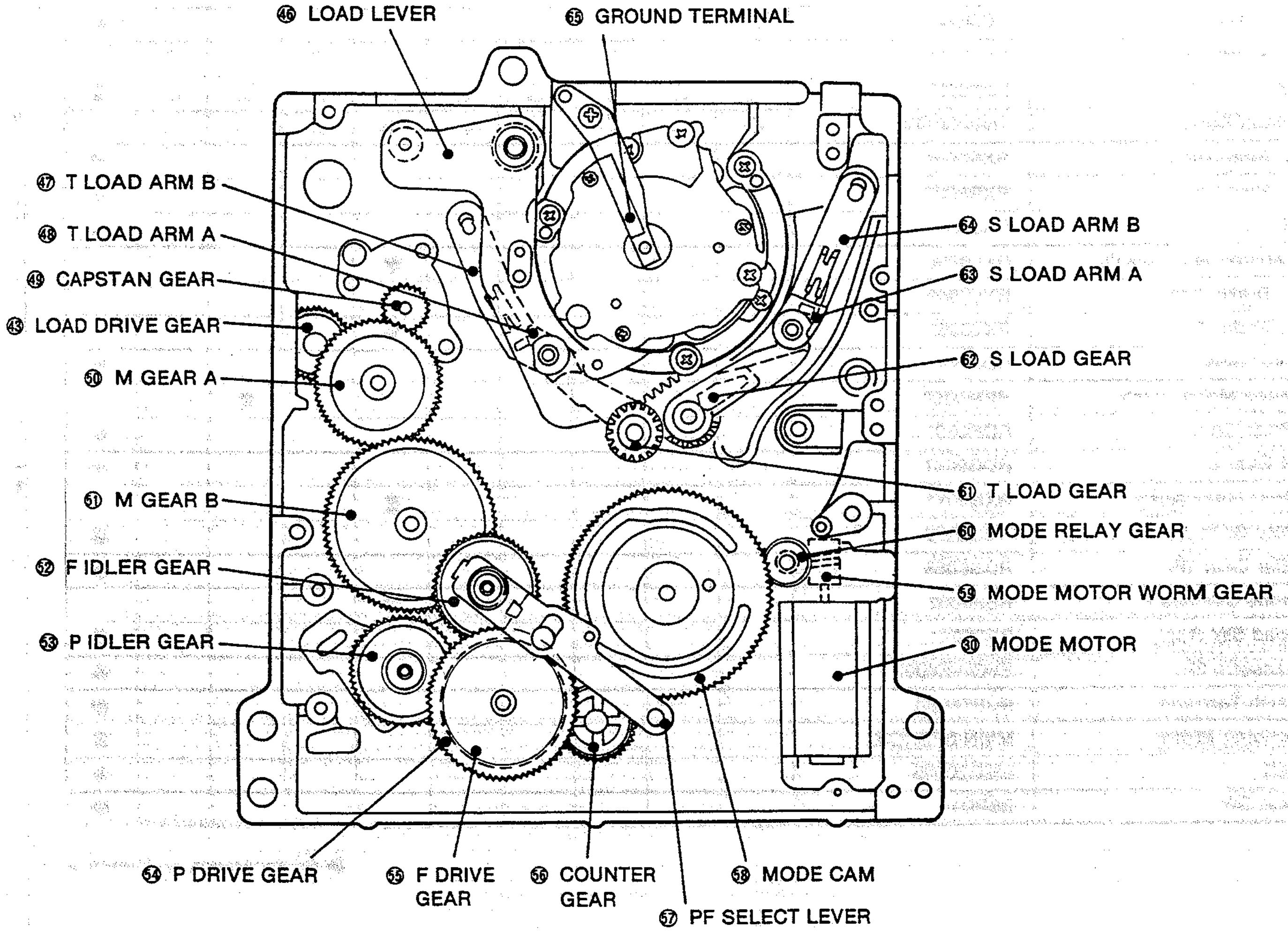
• Top view


③ T. POST ROLLER
④ T. INCLINED BASE (FIXED)
② CYLINDER
① LIGHTHOUSE TYPE RADIATION LED
⑤ T. STOPPER
⑥ LOAD SW
㊵ S.STOPPER
⑦ PINCH ROLLER
⑧ T. FIXED POST
㊴ S. POST ROLLER
⑨ CAPSTAN MOTOR
㊳ S. FIXED POST
⑩ LOAD HOLDER
㊲ S. GUIDE ROLLER
⑪ T. GUIDE ROLLER
⑫ DATUM PIN
㊱ LID OPENER
⑬ GUIDE ARM STOPPER
㉟ DATUM PIN
⑭ LOAD SELECT LEVER
㉞ END DET. SENSOR
⑮ BEGIN DET. SENSOR
㉝ TENSION ARM
⑯ PINCH LEVER
㉜ TENSION BAND
⑰ GUIDE LINK
⑱ PINCH ARM
㉛ TENSION SPRING
⑲ PIN-PRESSURE LINK
㉚ MODE MOTOR
⑳ T. REEL (TAKE UP SIDE)
㉑ CASSETTE SW
㉙ S. REEL (SUPPLY SIDE)
㉒ T. BRAKE
㉓ IDLER GUIDE
㉔ IDLER ARM
㉘ S. BRAKE
㉕ IDLER GEAR
㉖ BT LEVER
㉗ BT SPRING

• Side view


CAPSTAN MOTOR ⑨
⑮ BEGIN DET. SENSOR
⑳ T. REEL
LOAD SW ⑥
㊶ LOADING CAM
㊺ PINCH ROLLER SPRING
㊷ LOADING WORM
㉑ CASSETTE SW
㊸ LOAD DRIVE GEAR
㊹ MR DET. ELEMENT

• Bottom view


㊻ LOAD LEVER
(65) GROUND TERMINAL
㊼ T LOAD ARM B
㊽ T LOAD ARM A
(64) S LOAD ARM B
㊾ CAPSTAN GEAR
(63) S LOAD ARM A
㊸ LOAD DRIVE GEAR
(62) S LOAD GEAR
㊿ M GEAR A
(61) T LOAD GEAR
(51) M GEAR B
(60) MODE RELAY GEAR
(52) F IDLER GEAR
(59) MODE MOTOR WORM GEAR
(53) P IDLER GEAR
㉚ MODE MOTOR
(54) P DRIVE GEAR
(55) F DRIVE GEAR
(56) COUNTER GEAR
(58) MODE CAM
(57) PF SELECT LEVER

• MECHANISM CONTROLS AND FUNCTIONS

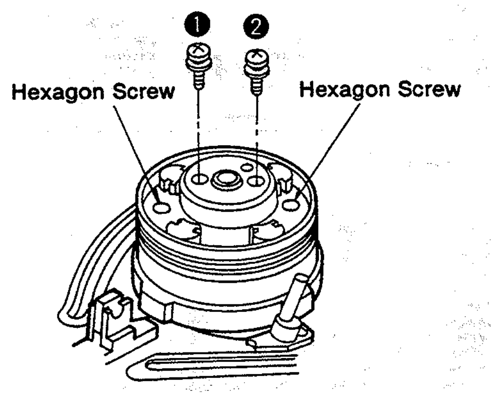
① LIGHT HOUSE TYPE RADIATION LED	Lighthouse-shaped, LEDs blink at start and end of tape.
② CYLINDER	30mm in diameter, 40 FG pulses, maintains specified speed of 1000 to 3000rpm.
③ T. POST ROLLER	Regulates tape travel position (upper edge).
④ T. INCLINED BASE (FIXED)	Regulates angle (90°) at which tape is wound around cylinder (stationary).
⑤ T. STOPPER	Determines position of T post roller base during loading.
⑥ LOAD SW	Two-bit rotary switch, detects loading position.
⑦ PINCH ROLLER	Presses against tape during play and review.
⑧ T. FIXED POST	Regulates tape travel position.
⑨ CAPSTAN MOTOR	1.5mm in diameter, 290 FG pulses.
⑩ LOAD HOLDER	Contains loading drive gear and worm gear, engages and disengages M gear A.
⑪ T. GUIDE ROLLER	Regulates tape travel position (top edge).
⑫ DATUM PIN	Regulates width and height (right side) during loading of cassette tape.
⑬ GUIDE ARM STOPPER	Determines position of T guide roller base K during loading.
⑭ LOAD SELECT LEVER	Switches engagement and disengagement of loading gear in accordance with loading conditions.
⑮ BEGIN DET. SENSOR	Light-receiving element for LED (detection at start of tape).
⑯ PINCH LEVER	Presses pinch roller against tape during play and review.
⑰ GUIDE LINK	Links T post roller base and guide roller base.
⑱ PINCH ARM	Comprised of pinch roller and T holding post, presses against the capstan.
⑲ PIN-PRESSURE LINK	Connected by the pin pressure spring and the pinch arm.
⑳ T. REEL (TAKE UP SIDE)	Take-up reel base, 64 FG pulses.
㉑ CASSETTE SW	Detects cassette information (mistaken erasure, cassette detection).
㉒ T. BRAKE	Presses brake gear against reel base gear to perform braking.
㉓ IDLER GUIDE	Holding cover for idler arm and S and T brakes.
㉔ IDLER ARM	Moves left or right in accordance with mode condition, transmits movement of counter gear to S and T reels.

㉕ IDLER GEAR	Transmits movement to S and T reels in accordance with mode.
㉖ BT LEVER	Applies back tension to T reel during review.
㉗ BT SPRING	Provides pressure for back tension lever.
㉘ S. BRAKE	Presses brake shoe against S reel base gear to perform braking.
㉙ S. REEL (SUPPLY SIDE)	Supply reel base, 64 FG pulses.
㉚ MODE MOTOR	6.5V DC motor, switches mode by forward and reverse revolution.
㉛ TENSION SPRING	Provides back tension force of tension regulator.
㉜ TENSION BAND	Mounted to tension regulator, applies back tension to S reel base.
㉝ TENSION ARM	Detects tape condition and applies back tension during play and review.
㉞ END DET. SENSOR	Light-receiving element for LED (detection at end of tape).
㉟ DATUM PIN	Regulates width and height (left side) during loading of cassette tape.
㊱ LID OPENER	Opens cassette lid during loading of tape.
㊲ S. GUIDE ROLLER	Regulates tape travel position (bottom edge).
㊳ S. FIXED POST	Regulates tape travel (bottom edge).
㊴ S. POST ROLLER	Regulates tape travel position (top edge).
㊵ S. STOPPER	Determines position of S post roller base during loading.
㊶ LOADING CAM	Uses movement transmitted from loading worm to move loading lever.
㊷ LOADING WORM	Transmits movement of loading drive gear and loading cam.
㊸ LOAD DRIVE GEAR	Transmits movement of M gear A and loading worm, engages and disengages in accordance with mode.
㊹ MR DET. ELEMENT	Detects magnetic changes (290 pulses) of flywheel.
㊺ PINCH ROLLER SPRING	Mounted to the pinch arm, returns the pinch roller.
㊻ LOAD LEVER	Transmits movement of load cam and load gear.
㊼ T LOAD ARM B	Uses movement transmitted from T load gear to play loading.
㊽ T LOAD ARM A	
㊾ CAPSTAN GEAR	Uses movement transmitted from capstan motor to move M gear A.

㊿ M GEAR A	Transmits movement of capstan gear and load drive gear.
(51) M GEAR B	Transmits movement of M gear A and F (R) idler gear, engages and disengages in accordance with mode.
(52) F IDLER GEAR	Transmits movement of M gear B and F drive gear.
(53) P IDLER GEAR	Transmits movement of M gear B and P drive gear.
(54) P DRIVE GEAR	Transmits movement of P idler gear and counter gear.
(55) F DRIVE GEAR	Transmits movement of F idler gear and counter gear.
(56) COUNTER GEAR	Transmits movement of F (P) drive gear and idler gear, engages and disengages in accordance with mode.
(57) PF SELECT LEVER	Switches engagement and disengagement of F (P) idler gear in accordance with mode conditions.

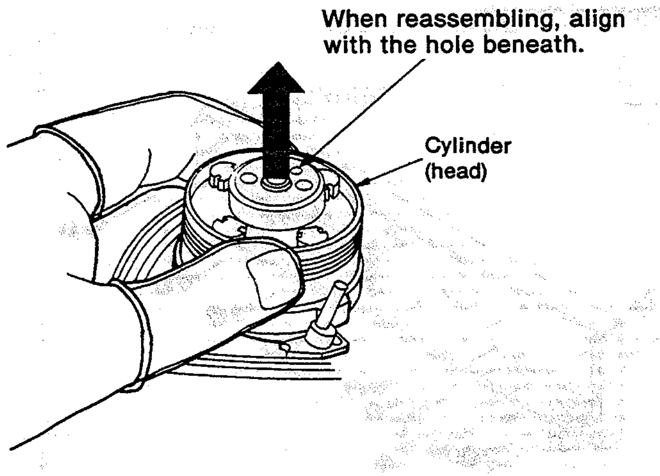
(58) MODE CAM	Uses movement transmitted from mode relay gear to detect mode positions.
(59) MODE MOTOR WORM GEAR	Transmits movement of mode motor and mode relay gear.
(60) MODE RELAY GEAR	Transmits movement of mode motor worm gear and mode cam.
(61) T LOAD GEAR	Transmits movement of load lever and S load gear.
(62) S LOAD GEAR	Transmits movement of T load gear and S load arm A (B).
(63) S LOAD ARM A	Uses movement transmitted from S load gear to play loading.
(64) S LOAD ARM B	
(65) GROUND TERMINAL	Ground terminal for cylinder motor.

• REMOVAL OF THE UPPER CYLINDER



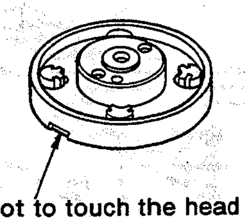
1. Remove the 2 screws (❶, ❷).

Caution: Please do not touch Hexagon screws.



2. Remove the cylinder (head) in the direction of the arrow.

Note: Do not touch the cylinder (head) with your bare hand; always be sure to wear a glove or other protection.

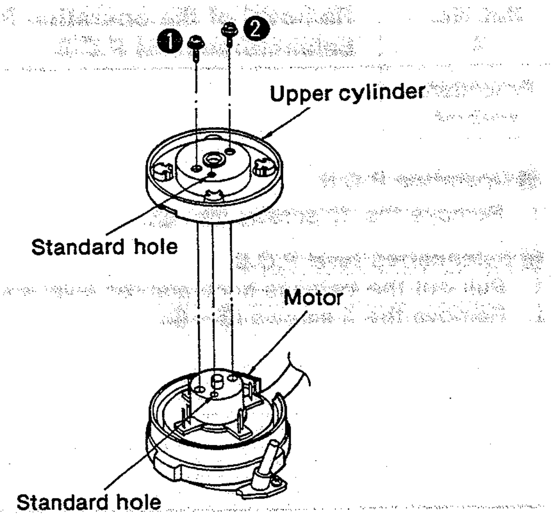


Be sure not to touch the head part.

* When reassembling the cylinder (head), be sure that the direction is correct. (If it is assembled in the wrong direction, data read errors will occur.)

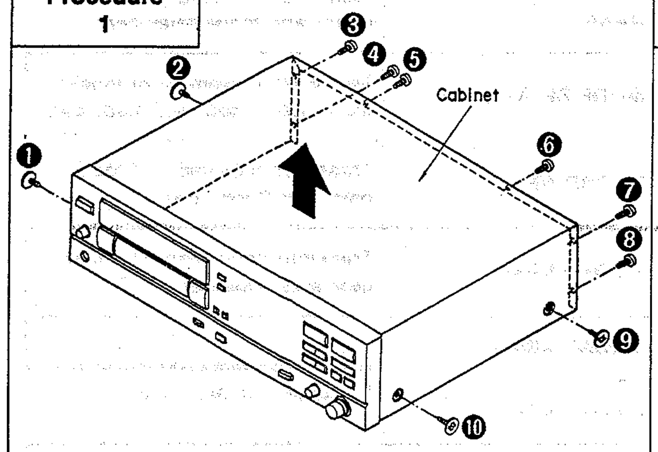
• UPPER CYLINDER MOUNTING

1. Mount the upper cylinder matching the motor's standard hole with the cylinder.
2. Insert the 2 screws (❶, ❷).



■ DISASSEMBLY INSTRUCTIONS

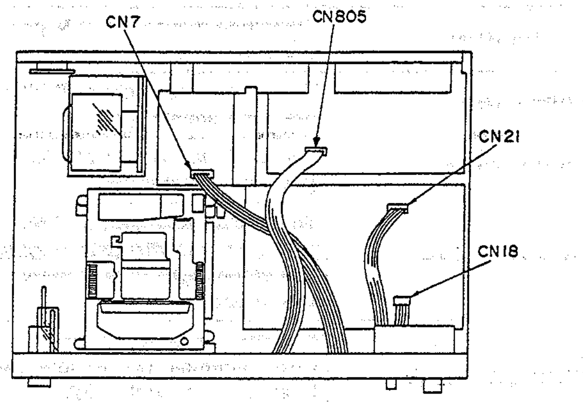
Ref. No. 1	Removal of the cabinet
Procedure 1	


❶
❷
❸
❹
❺
❻
❼
❽
❾
❿
Cabinet

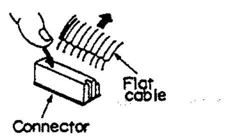
- Remove the 10 screws (❶~❿).

Ref. No. 2	Removal of the front panel
Procedure 1→2	

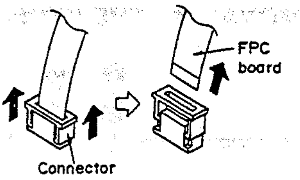
1. Remove the flat cables (CN7, CN18, CN805).
2. Remove the FPC board (CN21).

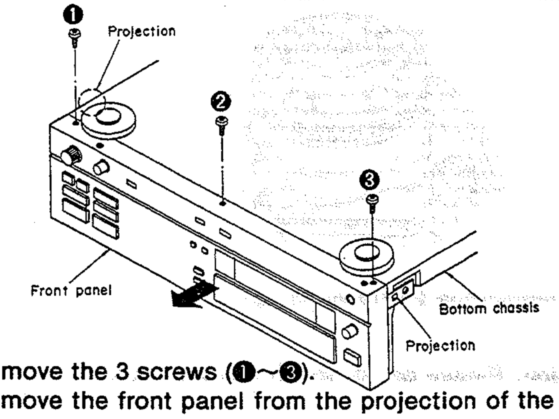

CN7
CN805
CN21
CN18

- Pull out the flat cable while pressing the connector. (CN7, CN18, CN805)


Flat cable
Connector

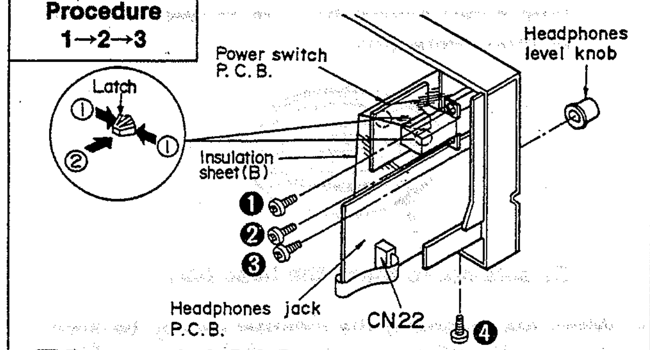
1. Lift the connector.
2. Pull out the FPC board.


FPC board
Connector


❶
Projection
❷
❸
Front panel
Bottom chassis
Projection

3. Remove the 3 screws (❶~❸).
4. Remove the front panel from the projection of the bottom chassis.

Ref. No. 3	Removal of the power switch P.C.B. and headphones jack P.C.B.
Procedure 1→2→3	


Latch
①
②
①
Power switch P. C. B.
Headphones level knob
Insulation sheet (B)
❶
❷
❸
Headphones jack P.C.B.
CN22
❹

■ Power switch P.C.B.

1. Remove the 2 screws (❶, ❷).
2. Remove the latch.
3. Remove the insulation sheet (B).

■ Headphones jack P.C.B.

1. Remove the headphones level knob.
2. Remove the FPC board (CN22).
3. Remove the 2 screws (❸, ❹).

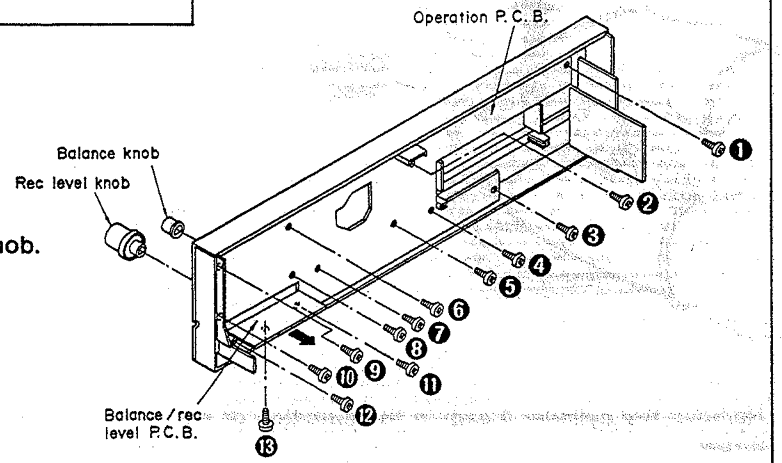
Ref. No. 4	Removal of the operation P.C.B. and balance/rec level P.C.B.
Procedure 1→2→4	

■ Operation P.C.B.

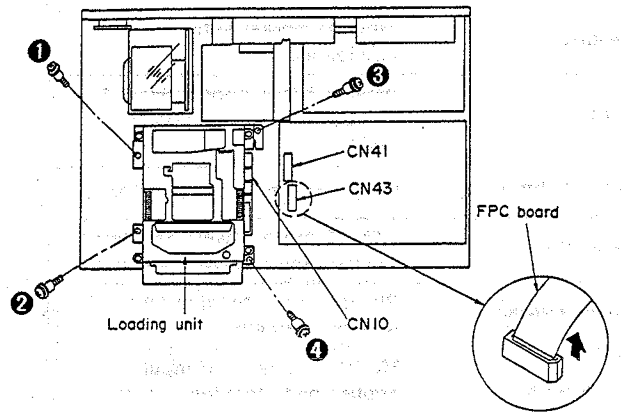
1. Remove the 10 screws (❶~❿).

■ Balance/rec level P.C.B.

1. Pull out the balance knob and rec level knob.
2. Remove the 3 screws (⓫~⓭).

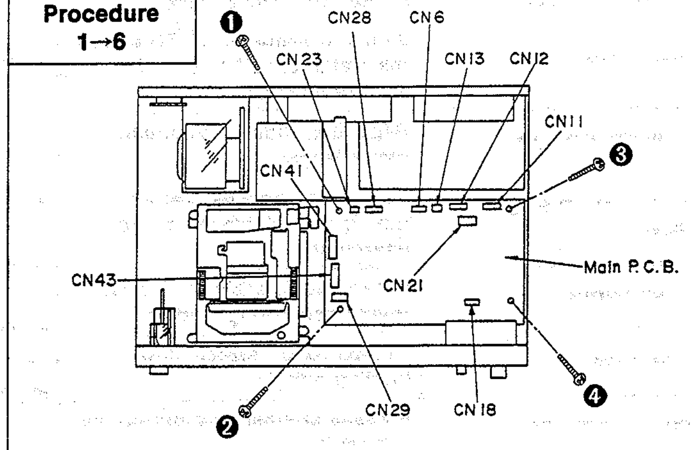

Operation P. C. B.
Balance knob
Rec level knob
❶
❷
❸
❹
❺
❻
❼
❽
❾
❿
⓫
⓬
⓭
Balance / rec level P.C. B.

Ref. No. 5	Removal of the loading unit
Procedure 1→2→5	


❶
❸
CN41
CN43
FPC board
❷
Loading unit
❹
CN10

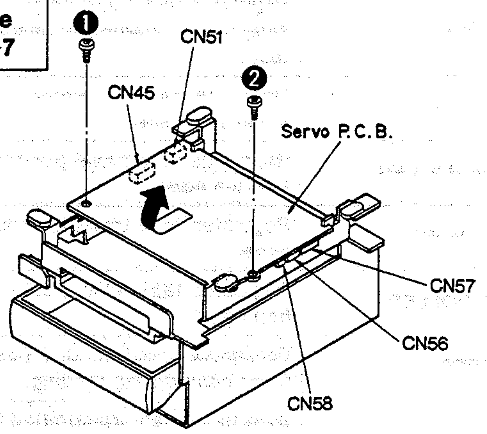
1. Remove the FPC board (CN43).
2. Remove the connectors (CN10, CN41).
3. Remove the 4 screws (❶~❹).

Ref. No. 6	Removal of the main P.C.B.
Procedure 1→6	

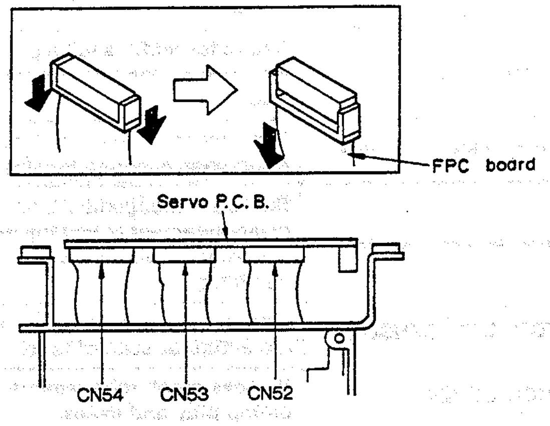

❶
CN28
CN6
CN23
CN13
CN12
CN11
❸
CN41
CN43
CN21
Main P.C.B.
❷
CN29
CN18
❹

1. Remove the connectors (CN11, CN12, CN41).
2. Remove the flat cables (CN6, CN13, CN18, CN23, CN28, CN29).
3. Remove the FPC boards (CN21, CN43).
4. Remove the 4 screws (❶~❹).

Ref. No. 7	Removal of the servo P.C.B.
Procedure 1→2→5→7	

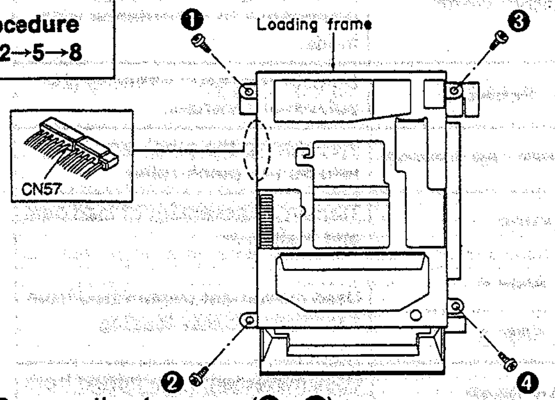

❶
CN51
CN45
❷
Servo P.C.B.
CN57
CN56
CN58

1. Remove the connectors (CN45, CN51, CN56, CN57, CN58).
2. Remove the 2 screws (❶, ❷).

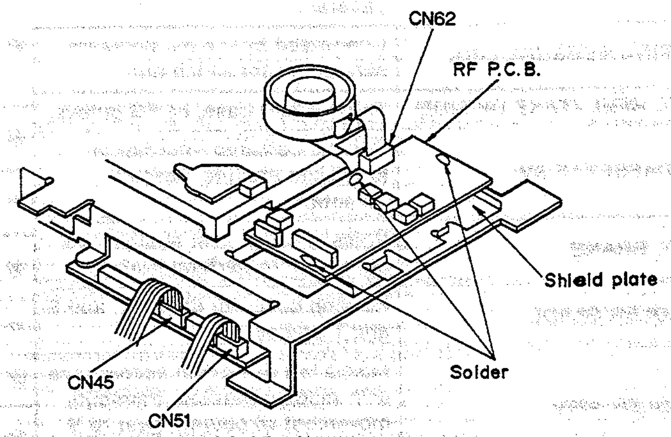

FPC board
Servo P.C.B.
CN54
CN53
CN52

3. Remove the servo P.C.B. in the direction of the arrow.
4. Remove the FPC boards (CN52, CN53, CN54).

Ref. No. 8	Removal of the RF P.C.B.
Procedure 1→2→5→8	


❶
Loading frame
❸
CN57
❷
❹

1. Remove the 4 screws (❶~❹).
2. Remove the loading frame.
3. Remove the connector (CN57).

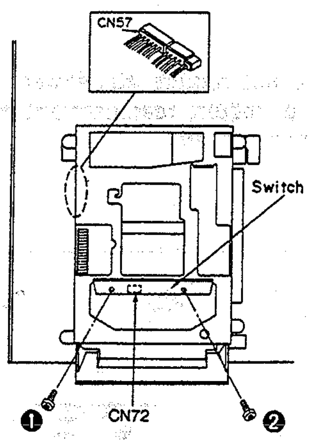

CN62
RF P.C.B.
Shield plate
Solder
CN45
CN51

4. Unsolder the shield plate.
5. Remove the FPC board (CN62).
6. Remove the connectors (CN45, CN51).

Ref. No. 9

Removal of the switch P.C.B.

Procedure 1→2→9

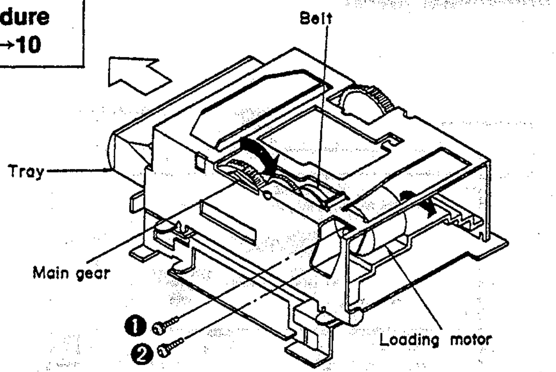

CN57
Switch P.C.B.
CN72
❶
❷

1. Remove the 2 screws (❶, ❷).
2. Remove the connectors (CN57, CN72).

Ref. No. 10

Removal of the loading motor

Procedure 1→2→10

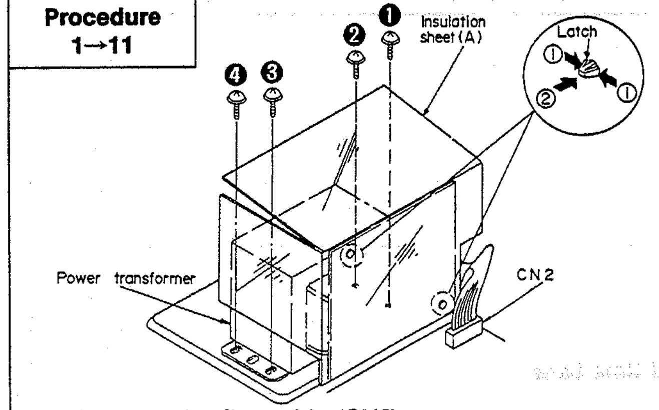

Belt
Tray
Main gear
❶
❷
Loading motor

1. Roll the main gear in the direction of the arrow, and draw out the tray.
2. Remove the belt.
3. Remove the 2 screws (❶, ❷).
4. Remove the loading motor in the direction of the arrow.

Ref. No. 11

Removal of the power transformer

Procedure 1→11

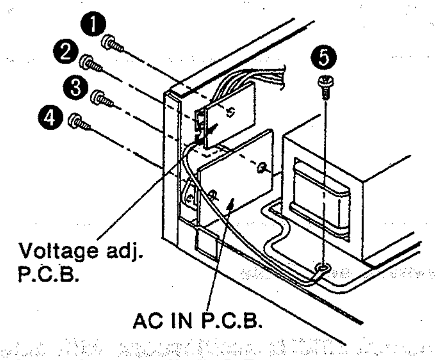

❶
❷
❸
❹
Insulation sheet (A)
Latch
①
②
Power transformer
CN2

1. Remove the flat cable (CN2).
2. Remove the 4 screws (❶~❹).
3. Remove the latch.
4. Remove the insulation sheet (A).

Ref. No. 12

Removal of the voltage adj. P.C.B. and AC IN P.C.B.

Procedure 1→12


❶
❷
❸
❹
❺
Voltage adj. P.C.B.
AC IN P.C.B.

■ **Removal of the voltage adj. P.C.B.**

- Remove the 2 screws (❶, ❷).

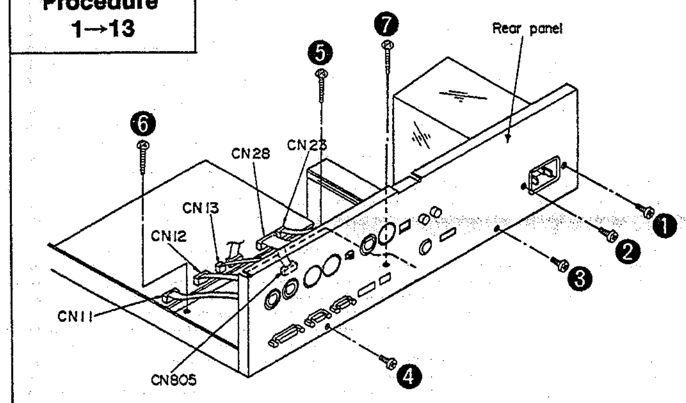
■ **Removal of the AC IN P.C.B.**

- Remove the 3 screws (❸~❺).

Ref. No. 13

Removal of the rear panel

Procedure 1→13

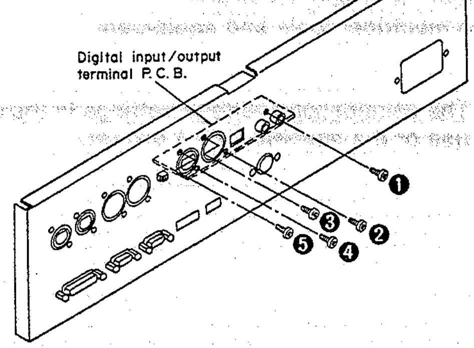

❼
Rear panel
❺
❻
CN28
CN23
CN13
CN12
CN11
CN805
❶
❷
❸
❹

1. Remove the connectors (CN11, CN12).
2. Remove the flat cables (CN13, CN23, CN28, CN805).
3. Remove the 7 screws (❶~❼).

Ref. No. 14

Removal of the digital input/output terminal P.C.B.

Procedure 1→13→14


Digital input/output terminal P.C.B.
❶
❷
❸
❹
❺

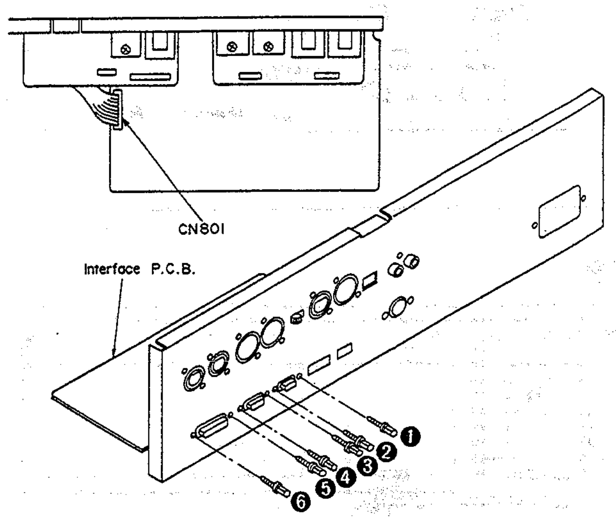
- Remove the 5 screws (❶~❺).

Ref. No. 15

Removal of the interface P.C.B.

Procedure 1→13→15

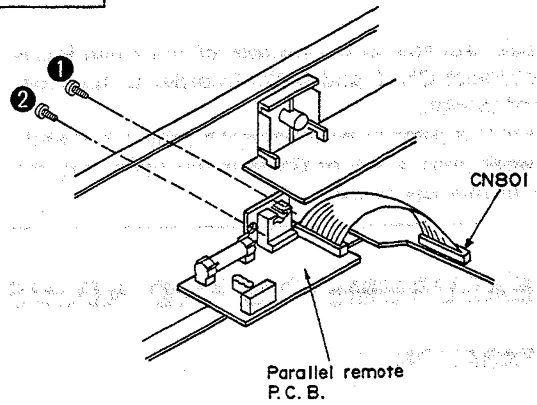
1. Remove the flat cable (CN801).
2. Remove the 6 screws (❶~❻).


CN801
Interface P.C.B.
❶
❷
❸
❹
❺
❻

Ref. No. 16

Removal of the parallel remote P.C.B.

Procedure 1→13→16

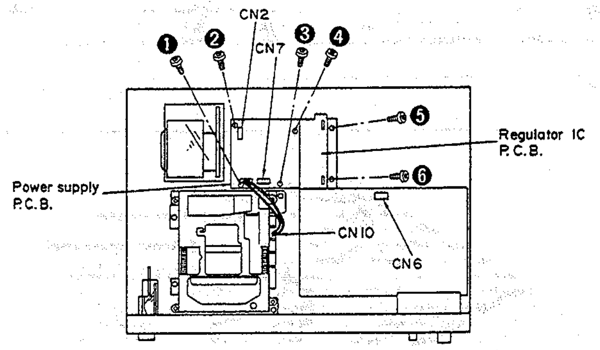

❶
❷
CN801
Parallel remote P.C.B.

1. Remove the flat cable (CN801).
2. Remove the 2 screws (❶, ❷).

Ref. No. 17

Removal of the power supply P.C.B. and regulator IC P.C.B.

Procedure 1→13→17


CN2
CN7
❶
❷
❸
❹
❺
❻
Regulator IC P.C.B.
Power supply P.C.B.
CN10
CN6

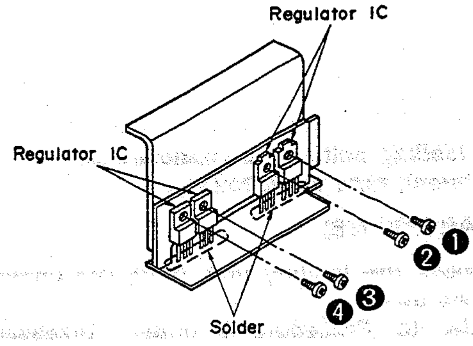
1. Remove the connector (CN10).
2. Remove the flat cables (CN2, CN6, CN7).
3. Remove the 6 screws (❶~❻).

Ref. No. 18

Removal of the regulator IC

Procedure 1→13→17→18

1. Unsolder the regulator IC.
2. Remove the 4 screws (❶~❹).


Regulator IC
Regulator IC
❶
❷
❸
❹
Solder

- When mounting the regulator IC, apply silicone compound (SZZ0L15 or equivalent) to the rear of the regulator IC.

Ref. No. 19

Removal of the output level switch P.C.B. and analog input/output terminal P.C.B.

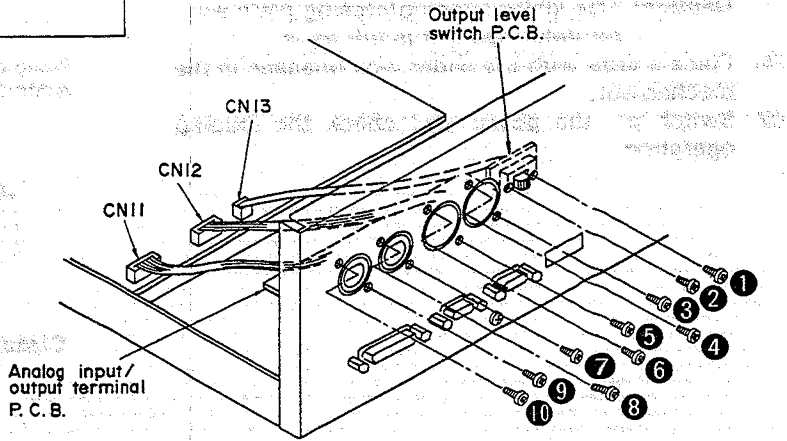
Procedure 1→19

■ **Output level switch P.C.B.**

1. Remove the 2 screws (❶, ❷).
2. Remove the flat cable (CN13).

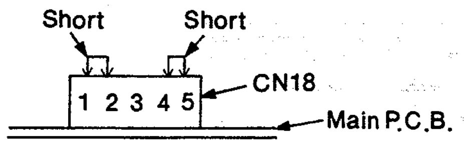
■ **Analog input/output terminal P.C.B.**

1. Remove the 8 screws (❸~❿).
2. Remove the flat cables (CN11, CN12).


Output level switch P.C.B.
CN13
CN12
CN11
❶
❷
❸
❹
❺
❻
❼
❽
❾
❿
Analog input/output terminal P.C.B.

Ref. No. 20	How to check the main P.C.B.
Procedure 20	

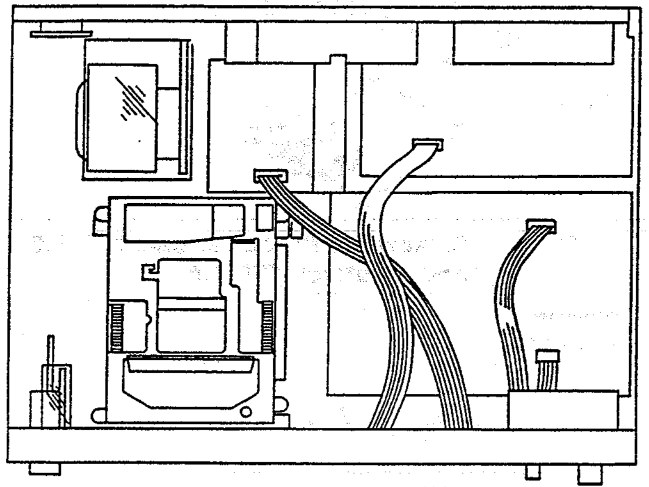
To gain access to the bottom of the main P.C.B., disconnect CN18 and CN21 in order to turn the board upward.
Connect a jumper wire between pins 1 & 2 and between pins 4 & 5 of CN18 when operating the unit in this condition.


Short
Short
1 2 3 4 5
CN18
Main P.C.B.

■ MEASUREMENTS AND ADJUSTMENTS

• PREPARATION

(1) Remove the cabinet
(Refer to Procedure 1 under "Disassembly Instructions").



■ If the loading unit is to be removed for adjustment, note the following.

(PREPARATIONS)

1. Remove the loading unit. (With the underside facing up.)
   (Refer to Procedure 5 under "Disassembly Instructions." However, leave the flat cable and the connector as they are.)
2. Open the cassette holder.
3. Move the slider opening/closing plate of the removed loading unit in the direction indicated by the arrow in Fig. 1, and hook it above the prong of the reinforcement plate.
   Caution: The slider opening/closing plate will be deformed if it is left as is.
4. Place a tape with the slider lock released in the mechanism.
5. Switch on the power and check the loading operation.

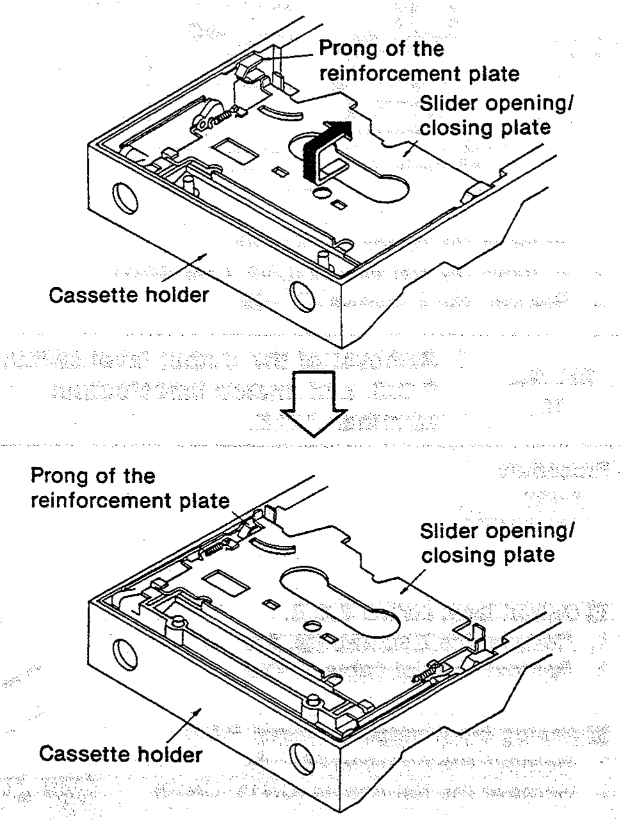
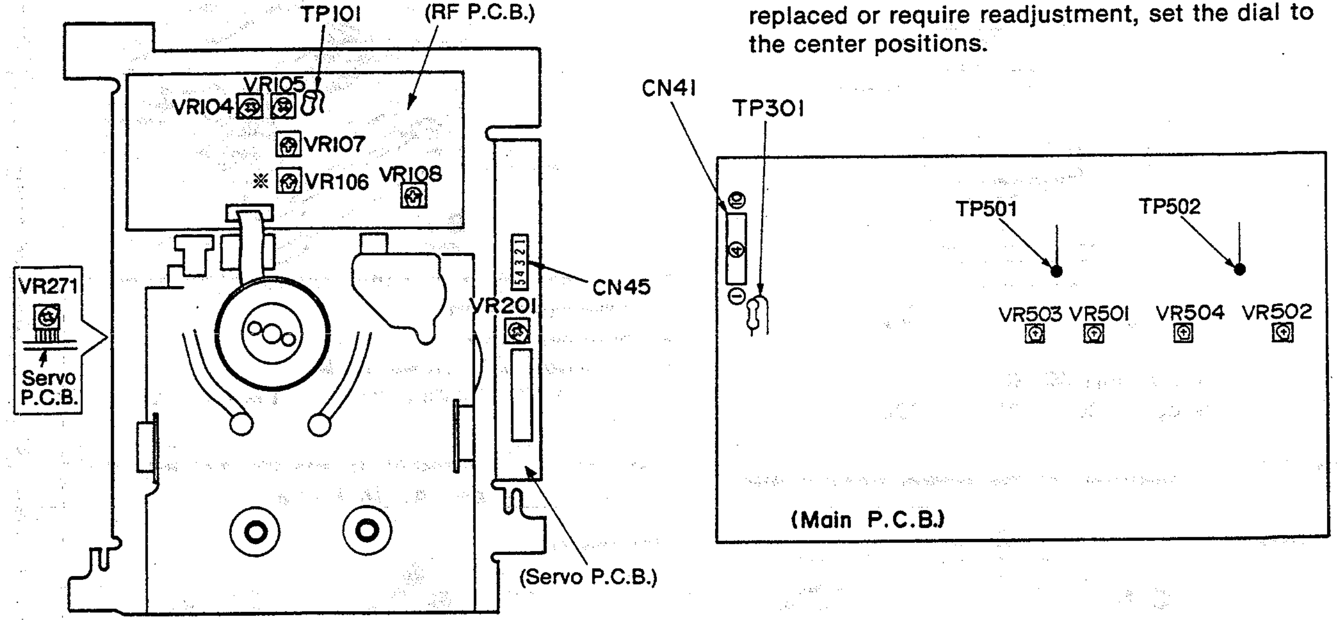

Prong of the reinforcement plate
Slider opening/ closing plate
Cassette holder
Prong of the reinforcement plate
Slider opening/ closing plate
Cassette holder

Fig. 1

• ELECTRICAL ADJUSTMENT

• Adjustment points


TP101
(RF P.C.B.)
VR105
VR104
VR107
※ VR106
VR108
VR271
Servo P.C.B.
CN45
5 4 3 2 1
VR201
(Servo P.C.B.)
CN41
TP301
TP501
TP502
VR503
VR501
VR504
VR502
(Main P.C.B.)

※ VR106 do not require adjustment; if the VR is replaced or require readjustment, set the dial to the center positions.

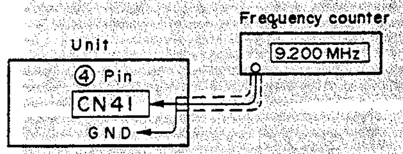
Equipment and Tools

- 2-channel 30MHz oscilloscope with external trigger and dual time base
- 2 oscilloscope probes (10 : 1)*
- Frequency counter
- AF oscillator (OSC)
- Distortion analyser
- DC electronic voltmeter (EVM)
- Post roller adjustment screwdriver
  : SZZV1102C
- Standard test tapes
  : RD-PG01 (PG reference tape)
  : RD-ER01 (Error rate tape)
  : RD-LR02 (Linearity adjustment tape)
- Blank DAT cassette for recording and playback
  : RT-R60P, RT-R90P, RT-R120P
- Standard electrical tools and equipment

* **NOTE:** The oscilloscope voltage settings in the charts and the waveform examples assume use of the specified 10: 1 probes.

1. PLL Free Run Adjustment

1. Connect the frequency counter as shown in figure.
2. Set the power switch to **"ON"**.
3. Open the cassette holder drawer.
4. Adjust **VR108** as required until the frequency counter reads **9.2±0.2MHz.**

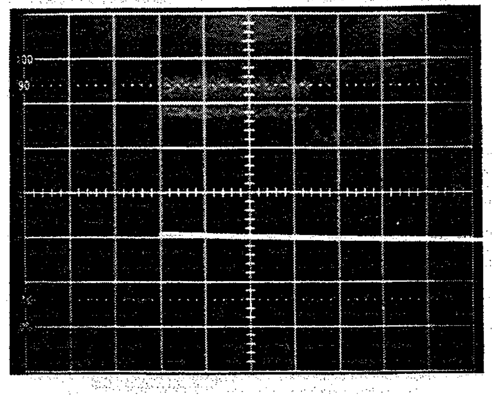

Unit
④ Pin
CN41
GND
Frequency counter
9.200 MHz

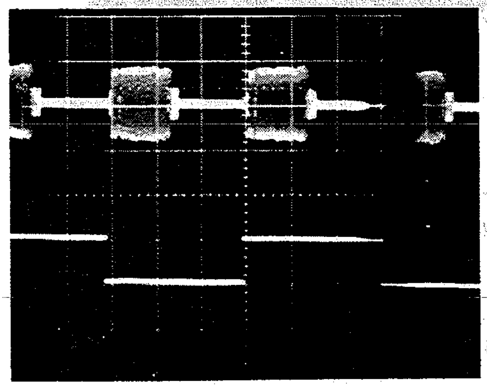
2. PG Phase Adjustment

1. Set up the oscilloscope and connect as shown below.

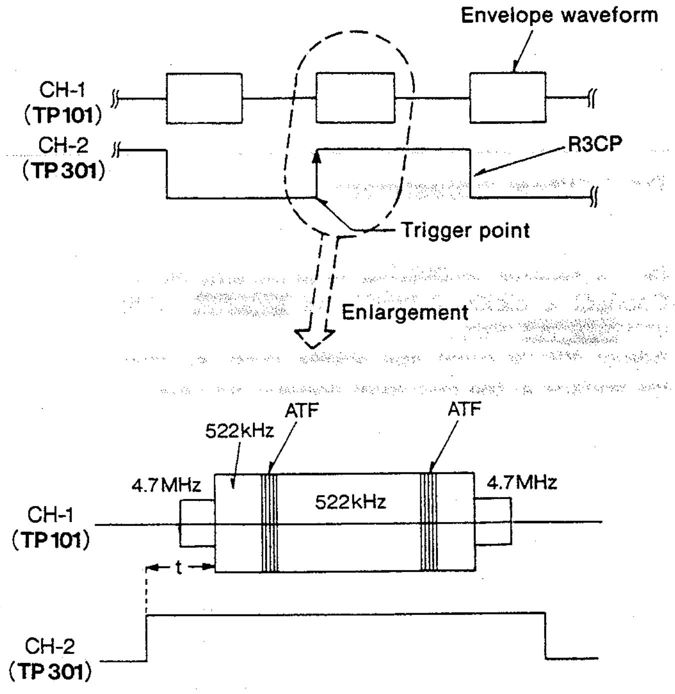
	CH-1	CH-2
Test point	**TP101 (RPRF)**	**TP301 (R3CP)**
Volts/Div.	50mV	0.5V
Time/Div.	5msec.	
Delay Time/Div.	50µsec.	
Trig.	CH-2	
AC-GND-DC	AC	DC
Adjustment point	**VR201**	

2. Note the "t" time indicated on the PG reference tape (RD-PG01), then load and play the tape.
3. While the tape is being played, the waveform shown on the right should appear.
4. Adjust the delay time for the dual time base to display the leading edge of the CH-2 (R3CP) waveform.
5. The time from the leading edge of R3CP to the leading edge of the **522kHz** portion of the RF wafeform must be within **±40µsec** of the time indicated on the PG reference tape. Adjust **VR201** as required, so that the time "t" (in the figure below), falls within specified limits.





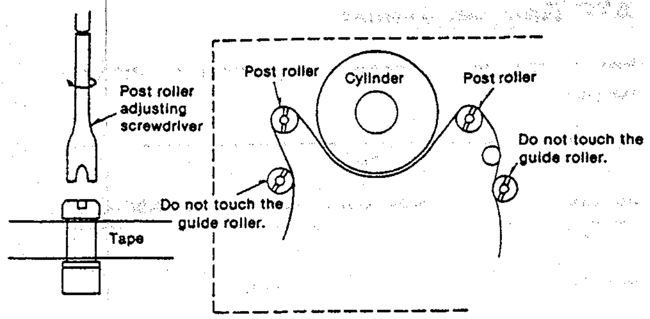
Note:
If the output levels of heads A and B are not equal, the "ATF RF Recording Level Adjustment" described in procedure 4 might be made improperly. Adjust the ATF RF Recording Level by following procedure 4 and then check the output level of the heads again. (At this time, it is not necessary to make adjustment dascribed in procedure 2.)


Envelope waveform
CH-1
(TP101)
CH-2
(TP301)
R3CP
Trigger point
Enlargement
522kHz
ATF
ATF
4.7MHz
522kHz
4.7MHz
CH-1
(TP101)
t
CH-2
(TP301)

t: Value (µsec) indicated on the standard tape ±40µsec.

3. Linearity Adjustment

CAUTION:
ONLY THE POST ROLLERS ARE USED FOR THE LINEARITY ADJUSTMENT. DO NOT ADJUST THE GUIDE ROLLERS.
THIS ADJUSTMENT IS VERY CRITICAL AND AFFECTS COMPATIBILITY WITH OTHER DAT RECORDERS.


Post roller adjusting screwdriver
Tape
Post roller
Cylinder
Post roller
Do not touch the guide roller.
Do not touch the guide roller.

1. Connect and set up the oscilloscope as follows:

	CH-1	CH-2
Test point	**CN45 ③ (PILOT)**	**TP301 (R3CP)**
Volts/Div.	0.2V	2.0V
Time/Div.	Ⓐ 5msec. Ⓑ 1msec. Ⓒ 0.2msec.	
Delay Time/Div.	——	
Trig.	CH-2	
AC-GND-DC	AC	DC
Adjustment point	**Post rollers (only)**	

2. Load and play the linearity adjustment tape (RD-LR02). Please use the recorded signal portion on tape (after 600 count from begining of tape)
3. Use the leading edge of the CH-2 (R3CP) waveform to trigger the oscilloscope to monitor the head "A" side of the RF signal envelope.
4. While the tape is playing, gradually adjust the height of the POST ROLLERS until the RF envelope (B) is rectangular.

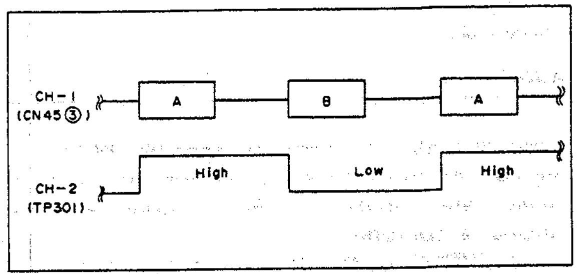
CAUTION 1:
ADJUSTMENTS MUST BE MADE VERY GRADUALLY.

CAUTION 2:
DO NOT "OVER ADJUST" the POST ROLLERS. It is unlikely that the POST ROLLERS will require more than a QUARTER of a turn in either direction to make the waveform rectangular.

5. Adjust **VR107** so that the amplitude (V_0) of the PILOT waveform Ⓒ is **1.8Vp-p.**
6. On the PILOT signal waveform Ⓒ, verify that the amplitude difference between adjacent tracks falls **within 200mV** (See figure below). If not, adjust the post rollers.
7. Play the standard test tape (RD-ER01), and perform the PG Phase adjustment and ATF gain adjustment again.

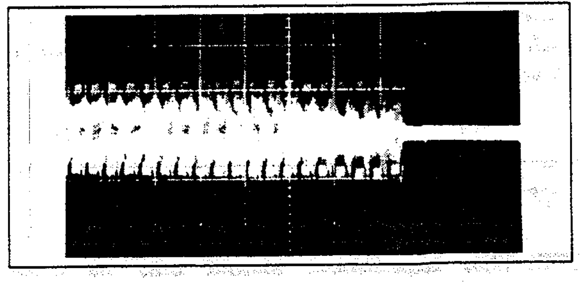
However, perform the ATF gain adjustment only when adjusting the linearity.

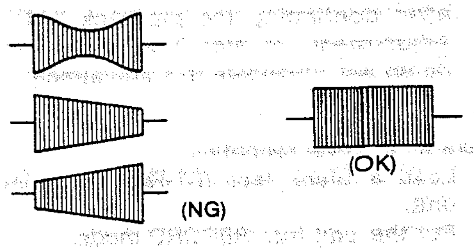
Ⓐ


CH-1
(CN45 ③)
A
B
A
CH-2
(TP301)
High
Low
High

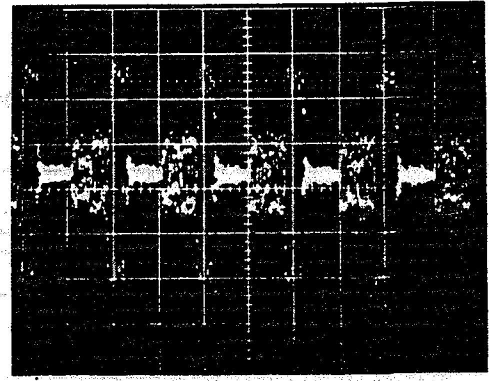
Ⓑ

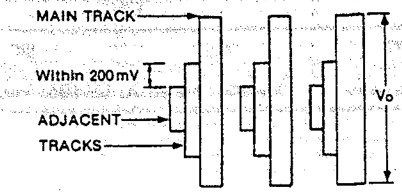
(OK)





Ⓒ



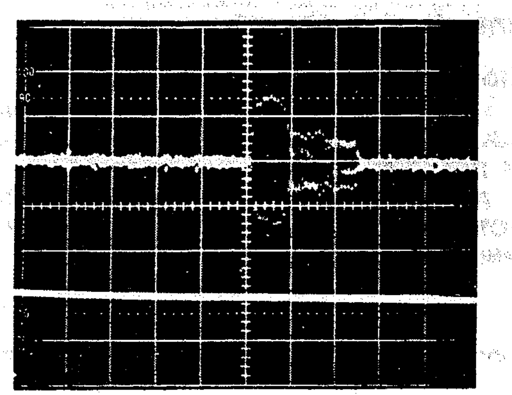

MAIN TRACK
Within 200mV
ADJACENT
TRACKS
Vo

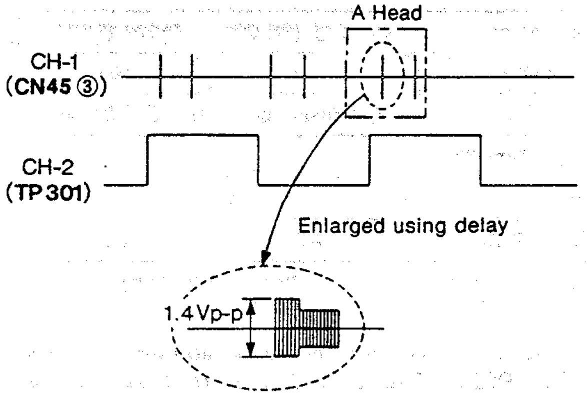
4. ATF Gain Adjustment

1. Set up the oscilloscope and connect as shown below.

	CH-1	CH-2
Test point	CN45 ③ (PILOT)	TP301 (R3CP)
Volts/Div.	50mV	0.5V
Time/Div.	5msec.	
Delay	0.1msec.	
Trig.	CH-2	
AC-GND-DC	AC	DC
Adjustment point	VR107	

2. Load and play the error rate tape (RD-ER01).
3. Adjust the delay time for the dual time base to select and display the PILOT signal with the largest amplitude.
4. Adjust **VR107** so that the amplitude of the PILOT signal is **1.4±0.2Vp-p**. Check the amplitudes of the other PILOT signals to insure that they are a minimum of **1.2Vp-p**. If not optimize the adjustment of **VR107** for the minimum signal level.





5. ATF RF Recording Level Adjustment

NOTE: This adjustment should only be made after confirming the playback "ATF Gain Adjustment" in step 3 above. Failing to do so will invalidate this adjustment.

1. Make a "0" level recording:
   (a) Load a blank tape (RT-R60P etc.) into the unit.
   (b) Put the unit into RECORD mode.
   (c) Run the tape, recording for a minimum of 20 to 30 seconds.
   (d) Rewind the tape to the beginning of the "0" level signal recording.
2. Connect and set up the oscilloscope as follows:

	CH-1	CH-2
Test point	CN45 ③ (PILOT)	TP301 (R3CP)
Volts/Div.	50mV	0.5V
Time/Div.	2msec.	
Delay Time/Div.	0.2msec.	
Trig.	CH-2	
AC-GND-DC	AC	DC
Adjustment point	VR104: Head A, VR105: Head B	

3. While playing back the blank signal portion of the tape, verify that the signal amplitude falls in the range of **1.4±0.2Vp-p.**

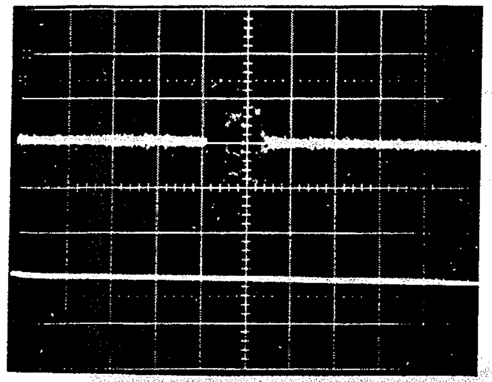
Standard value: 1.4±0.2Vp-p

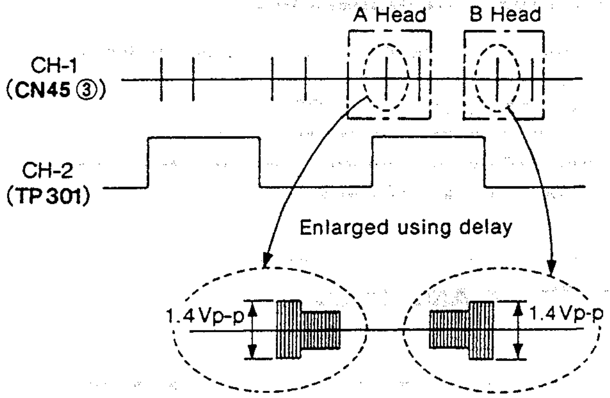
4. If the ATF signal is not within specification press the stop button and adjust **VR104** and **VR105** accordingly. Making finer adjustments as the trials approach the specified level.

LEVEL/HEAD	A: **VR104**	B: **VR105**
More than 1.6V	Turn ↻	Turn ↻
Less than 1.4V	Turn ↺	Turn ↺

After making the adjustment, make another blank signal recording, on a different portion of the tape (use the END SEARCH feature), for 20 to 30 seconds. Rewind the tape to the beginning of the new recording and repeat from step 3 until the specification is met.

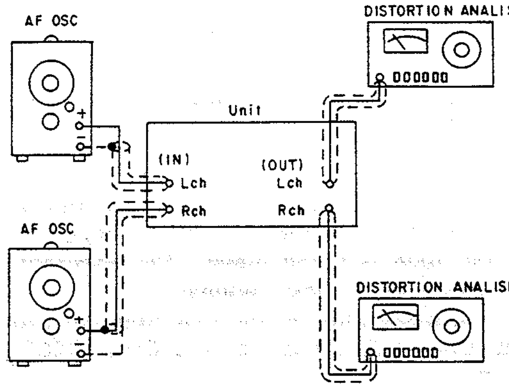
Note:
It is necessary to use a different portion of the tape for each trial because DAT does not erase the original signal, it "over writes" the new signal. Using a new portion of the tape will prevent maladjustment due to incomplete "over write" of the previously recorded signal.





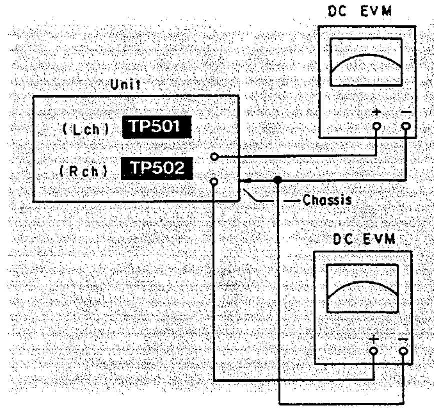
6. DAC Output Balance Adjustment

1. Load a blank tape for recording.
2. Use a signal generator to feed a 1kHz signal to ANALOG IN.
3. Set the recorder to the record mode and adjust **INPUT VR** so that the level meter moves to **−20dB.**
4. Adjust **VR501** (Lch) and **VR502** (Rch) to minimize the distortion rate. (Reference distortion rate of about 0.05%)
5. After adjustment, check that the playback output is **−20dB±0.2dB** with respect to 0dB at 1kHz.



7. DAC Offset Adjustment

1. Set the recorder to DIGITAL IN in the stop mode.
2. Connect a digital voltmeter to **TP501** (Lch) and **TP502** (Rch).
3. Adjust **VR503** (Lch) and **VR504** (Rch) so that the voltage at the test point above is **0±1mV.**



8. BOT/EOT Detection Sensitivity Verification and Adjustment

1. Make sure that the tape stops with the leader portion (the beginning and ending portion).

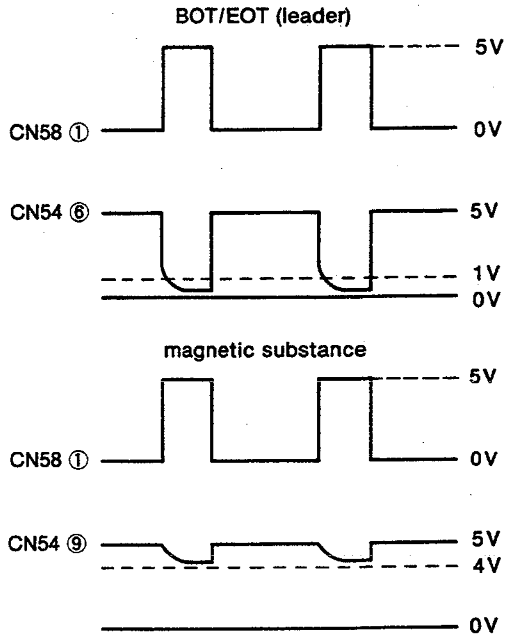
※ If the tape does not stop at the leader, make adjustment by following procedure outlined below.

①Insert a blank tape into the tape compartment of the set and press the playback button at the end of the tape.

②Set up the oscilloscope and connect as shown below.

	CH-1	CH-2
Test point	**CN54** ⑥(BOT/EOT) ⑨(magnetic substance)	**CN58** ①
Volts/Div.	0.2V	0.2V
Time/Div.	2msec.	
Delay	——	
Trig.	CH-2	
AC-GND-DC	AC	DC
Adjustment point	**VR271**	

③Adjust the amplitude of waveform to less than **1V** at the magnetic substance and more than **4V** at the leader on **VR271**.


BOT/EOT (leader)
5V
CN58 ①
0V
CN54 ⑥
5V
1V
0V
magnetic substance
5V
CN58 ①
0V
CN54 ⑨
5V
4V
0V

TERMINAL FUNCTION OF IC'S

- **IC101 (AN7030SE2): RF AMP.**

Pin No.	Mark	I/O Division	Function
1	V_{CC} 1	I	Power supply terminal
2	ACH FB	O	Playback feed back signal (Ach)
3	ACH IN	I	Playback amp. signal (Ach)
4	GND 1	—	GND terminal
5	BCH IN	I	Playback amp. signal (Bch)
6	BCH FB	O	Playback feed back signal (Bch)
7	AREC PCM	I	RF recording level adj. terminal
8	AREC PLT		
9	AREC ATF		
10	BREC ATF		
11	BREC PLT		
12	BREC PCM		
13	REC CNT 1	I	Track pitch signal
14	REC CNT 2	I	ATF area det. signal
15	SRRF IN	I	Recording signal
16	GND 2	—	GND terminal
17	VREF	O	Reference voltage terminal (Not used, open)
18	AREC OUT	O	Recording signal (Ach)
19	BREC OUT	O	Recording signal (Bch)
20	BTL REC	O	Recording control signal
21	V_{CC} 2	I	Power supply terminal
22	REC ON	O	Recording drive terminal (REC: "H")
	PLAY ON	O	Playback drive terminal (PLAY: "H")
24	HSW	I	Head switching signal
25	AR/RSEL	I	Not used, connected to power supply
26	R/PSEL	I	Recording/playback select signal (REC: "H", PLAY: "L")
27	EQ OUT	O	Equalization signal
28	EQ IN 3	I	Equalization amp. signal
29	EQ IN 2		
30	EQ IN 1		
31	BF REQ	I	Equalization amplitude drive terminal (Bch)
32	B PHASE	I	Equalization phase drive terminal (Bch)
33	B GAIN	I	Equalization gain drive terminal (Bch)
34	AF REQ	I	Equalization amplitude drive terminal (Ach)
35	A PHASE	I	Equalization phase drive terminal (Ach)
36	A GAIN	I	Equalization gain drive terminal (Ach)
37	SV RF	O	Playback signal
38	GND 3	—	GND terminal
39	A INT	I	Playback amp. signal (Ach)
40	B INT	I	Playback amp. signal (Bch)
41	B INT IN	O	Playback amp. signal (Bch)
42	A INT IN	O	Playback amp. signal (Ach)

- **IC801 (M37450M4-356): Microcomputer for interface**

Pin No.	Mark	I/O Division	Function
1	NAESDO	I	D I/O select terminal ("L": AES/EBU)
2	NHMTR	O	Hour meter control
3	TXD/ 422 OUT	O	Transceiver drive terminal
4	RXD/ 422 IN	I	
5 ~ 8	DSW11 ~ DSW8	I	DIP switch setting terminal
9 ~ 16	DTIN7 ~ DTIN0	I	S/P data input terminal
17	SDEN	O	Parallel data enable terminal ("H": enable)
18	PDEN	O	
19	OUTCONT	O	Transceiver drive enable terminal ("H": enable)
20	NC	—	Not used, open

Pin No.	Mark	I/O Division	Function
21	NCCLR	O	Full det. counter clear terminal ("L": clear)
22	RGFUL	I	S/P register full signal ("H" full)
23	BRK	I	Break det. terminal ("L": break)
24	NPRDY1	O	Ready signal ("L": ready)
25	R/W	O	Not used, open
26	SYNC		
27	GND	—	GND terminal
28	NRST2	I	Reset terminal ("L": reset)
29	XIN	I	Crystal OSC terminal (9.83 MHz)
30	XOUT	O	
31	BRKCLK	O	Break det. clock signal
32	GND	—	GND terminal
33 ~ 40	DINC1 ~ DINC8	I	DIN input signal
41 ~ 48	DSW7 ~ DSW0	I	DIP switch setting terminal
49 ~ 56	DTOUT7 ~ DTOUT0	O	P/S data signal
57 ~ 59	AN2 ~ AN0	—	Not used, connected to GND
60 • 61	DA2 • DA1	O	Not used, open
62	VREF	—	GND terminal
63	AVSS		
64	VCC	I	Power supply terminal

• IC202 (MN53020SDQ): ATF

Pin No.	Mark	I/O Division	Function
1	NSNCOK	O	SYNC det. monitor terminal
2	SVAL	I	ATF select terminal
3	PCMOK	I	PCM playback monitor terminal
4	SPE	O	Starting pulse of counter track lock
5	SP 2	O	Sampling pulse signal for pilot signal of adjacent track
6	SP 1		
7	DCYLPG	I	Cylinder PG signal
8	DCAPFG 1	I	Capstan FG signal
9	DCAPFG 2		
10	DRLFGT	I	Take-up reel FG signal
11	DCYLFG	I	Cylinder FG signal
12	SYNC	I	ATF sync. det. terminal
13	NRST	I	Reset signal
14	R3CP	I	Timing signal for RF envelope signal control
15	ENVT		
16	FCH	I	System clock signal (9.408 MHz)
17	V_{DD}	I	Power supply terminal
18	V_{SS}	—	GND terminal
19	MODE 1	I	SYNC det. select terminal (Not used, connected to GND)
20	HFCH	I	Clock signal for PLL off-set data
21	PLLOFS	I	PLL off-set data signal
22	TEST 6	—	Not used, connected to GND
23	P MODE	I	Pulse width select terminal
24 ~ 28	TEST 1 ~ TEST 5	I	Test terminal (Not used, connected to GND)
29	SPHT	—	Not used, open
30	HSWS	O	Head switching signal (33.33 Hz)
31	HSWR		
32	SEL A	I	CAPFGTU signal select terminal
33	SEL B	I	R3TU signal select terminal
34	PLL 0	O	Output signal after decoded 4 bit parallel data of PLLOFS
35	PLL 1		
36	PLL 2		
37	PLL 3		
38	MODE 2	—	Not used, open
39	V_{SS} 2	—	GND terminal
40	V_{DD} 2	I	Power supply terminal
41	R3TU	O	Building-up edge signal of R3CP/DRLFGT
42	CAPFGTU	O	Capstan FG signal/Take-up reel FG signal
43	CAPER	O	Capstan rotative direction control signal
44	NLNROK	O	Track linearity monitor terminal

• IC201 (MN6742SDR): Servo processor

Pin No.	Mark	I/O Division	Function
1	OP10A	O	Cylinder rotative stop signal
2	SCK	I	Serial clock signal
3	SDA	I/O	Serial data signal
4	OSC 1	I	System clock (8 MHz) signal
5	OSC 2	O	
6	NRST	I	Reset signal
7	NC	—	Not connection
8	OP20A	O	SSP ready signal
9	NC	—	Not connection
10	V_{SS}	—	GND terminal
11	VHS	—	Not used, open
12	OP 101	O	CAPFG/RLFGT select signal
13	TP 2	O	R3CP/RLFGT select signal
14	TP 3	I	PLL off-set/parallel data signal
15	TP 4		
16	TP 5		
17	TP 6		
18	TP 7	I	PLL off-set/data effective flag terminal
19	TP 8	I	Not used, connected to power supply
20	MOS	I	Serial port/strobe signal
21	TST	I	Test mode terminal (Normal, connected to GND)
22	ENC	—	Connected to GND terminal
23	NC	—	Not connection
24	NC		
25	V_{DD}	I	Power supply terminal
26	NC	—	Not connection
27	RSW	—	Not used, open
28	HAS	O	A/D input select signal
29	AVM	—	Not used, connected to GND
30	VLP	—	Not used, open
31	STM	I	R3TU or RLFGT (64 P/R) signal
32	STR	I	Comparator reference signal of STM input
33	CAE	O	Capstan velocity control signal
34	CYE	O	Cylinder velocity control signal
35	END	I	VREF or ATFTER voltage signal
36	VSY	I	$\overline{\text{CYLPG}}$ signal
37	ASH 1	I	Capstan FG or RLFGT signal after EXOR
38	NC	—	Not connection
39	AFB 1	O	Inverter amp. signal of ATFTER input (Not used, open)
40	NC	—	Not connection
41	AFG 1	I	ATF tracking error voltage terminal
42	ASH 2	O	Not used, connected to GND
43	AFB 2	O	Not used, open
44	NC	—	Not connection
45	AFG 2	I	Reference voltage terminal
46	VDA	I	Power supply terminal
47	VSA	—	GND terminal
48	ORE	O	Reference voltage terminal
49	IRE	I	
50	GND	—	GND terminal
51	IPL	O	Not used, open
52	NC	—	Not connection
53	CLP	I	Not used, connected to GND
54	CP 1	O	Not used, open
55	CP 2	I	Supply reel FG signal
56	NC	—	Not connection
57	NC		
58	CN 1	O	Not used, open
59	CN 2	I	Not used, connected to GND
60	CTL	O	Not used, open
61	PFG	I	Cylinder FG signal
62	PGM	I	Not used, connected to GND
63	CUL	O	Capstan rotative direction signal
64	NC	—	Not connection

• IC102 (AN7035SCE2): Playback PLL

Pin No.	Mark	I/O Division	Function
1	LPF	O	Buffer amp. 1 reference terminal
2	GND 1	—	GND terminal
3	ENVC	O	ENV time constant setting terminal
4	ENVR	I	ENV threshold voltage adj. terminal
5	RSENV	O	RF envelope signal
6	RSENVC	O	RSENV time constant setting terminal
7	RSRF	I	RF signal
8	DELOUT	O	RF signal
9	DELIN 1	I	Delay (45°) signal
10	DELIN 2	I	Delay (90°) signal
11	PDOUT	O	Phase comparator signal
12	VREF 1	I	V/I converter reference voltage terminal
13	VCOV	I	OSC frequency control terminal
14	R/P	I	Recording/playback select terminal (Not used, connected to GND)
15	VCOR	I	OSC frequency adj. terminal
16	V_{CC} 1	I	Power supply terminal
17	VCOC 1	O	VCO terminal
18	VCOC 2	O	VCO terminal
19	V_{CC} 2	I	Power supply terminal
20	PLL CP 1	O	Clock (2CK) signal (Not used, open)
21	PLL CP 2	O	Clock (CK) signal
22	DEMCOD	O	NRZI demodulated signal for playback signal with PLL
23	SVSYNC	O	ATF sync. signal
24	GND 2	—	GND terminal
25	OP OUT 3	O	ATF 3 signal
26	OP IN 3	I	ATF 3 signal
27	OP OUT 2	O	ATF 2 signal
28	OP IN 2	I	ATF 2 signal
29	OP OUT 1	O	ATF 1 signal
30	OP IN 1	I	ATF 1 signal
31	VREF 2	I	Reference voltage terminal
32	COMP 1	I	Output amp. 1 (+) signal

• IC405 (AK5326-VP): A/D converter

Pin No.	Mark	I/O Division	Function
1	AGND	—	Analog GND terminal
2	AINL	I	L ch analog signal input terminal
3	ZEROL	I	L ch zero level input terminal
4	VA+	I	Analog power supply terminal
5	VA−	I	Analog power supply terminal
6	APD	I	Analog power down terminal
7	ACAL	I	Analog calibration terminal
8	NC	—	Not connected
9	DCAL	O	Digital calibration terminal
10	DPD	I	Digital power down terminal
11	TST 1	I	Test terminal (Connected to GND)
12	TST 2		
13	TST 3		
14	L/$\overline{R}$	I	Input channel select terminal
15	SCLK	I	Serial data output clock terminal
16	SDATA	O	Serial data output terminal
17	VD1+	I	Digital power supply terminal
18	VD2+		
19	DGND	—	Digital GND terminal
20	DCLKA	I	Digital system clock terminal
21	NC	—	Not connected
22	ACLKA	O	Analog system clock terminal
23	CLKIN	I	Master clock terminal
24	LGND	—	Digital GND terminal
25	VL+	I	Digital power supply terminal
26	ZEROR	I	R ch zero level input terminal
27	AINR	I	R ch analog signal input terminal
28	VREF	O	Reference voltage terminal

• IC203 (AN8320NFA): Linear servo

Pin No.	Mark	I/O Division	Function
1	FG1 AO	O	Capstan FG signal
2	FG1 AI	I	Capstan FG (−) signal
3	FG1 FI	—	Frequency characteristic setting terminal
4	CYL PG	O	Cylinder PG signal
5	PGVR	—	PG delay time adj. terminal
6	CYPGI	I	PG schmidt comparator terminal
7	GND	—	GND terminal
8	SVRF	I	ATF terminal
9	CPD	—	Det. capacity connection terminal
10	CCI	O	Full-wave rectification buffer terminal
11	CCO	I	Clamp circuit terminal
12	SP 1	I	SP 1 terminal
13	SP 2	I	SP 2 terminal
14	VSPE	—	SPE setting terminal
15	SPE	I	SPE terminal
16	CSH	I	Hold capacity connection terminal
17	ATFTER	O	ATF control command signal
18	CFB	—	Phase compensation terminal
19	V_{CC}	I	Power supply terminal
20	ATFON	I	ATF ON terminal (Not used, connected to power supply)
21	PTBIA	—	Photo-transistor bias terminal (Not used, open)
22	VREF	O	Reference voltage terminal
23	LEDR 1	I	Bias voltage terminal
24	LEDH 1	—	Constant current terminal (Not used, open)
25	LEDR 2	I	Bias voltage terminal
26	LEDH 2	—	Constant current terminal (Not used, open)
27	CYL FG	O	Cylinder FG signal
28	CYF GSI	I	Cylinder schmidt comparator terminal
29	CYF GAO	O	Cylinder op. amp. terminal
30	CYF GAI	I	Cylinder op. amp. (−) terminal
31	NST BY	I	STAND BY signal (Not used, connected to power supply)
32	TF GAI	I	Take-up reel op. amp. (−) terminal
33	TF GAO	I	Take-up reel op. amp. terminal
34	TF GSI	I	Take-up reel schmidt comparator terminal
35	RLFGT	O	Take-up reel FG signal
36	RLFGS	O	Supply reel FG signal
37	SF GSI	I	Supply reel schmidt comparator terminal
38	SF GAO	O	Supply reel op. amp. terminal
39	SF GAI	I	Supply reel op. amp. terminal
40	V_{CC}	I	Power supply terminal
41	FG 2FI	—	Frequency characteristic setting terminal
42	FG 2AI	I	Capstan FG (−) signal
43	FG 2AO	O	Capstan FG signal
44	FG 2SI	I	Captan FG schmidt comparator terminal
45	CPFG 2	O	Capstan FG signal
46	FILSLD	I	Frequency characteristic $\overline{\text{DOWN}}$ terminal
47	CPFG 1	O	Capstan FG signal
48	FG 1SI	I	Capstan FG schmidt comparator terminal

- **IC271 (MN17541SDN2): Mechanism control**

Pin No.	Mark	I/O Division	Function
1	NSBOA	O	Serial data signal
2	NRST	I	Reset signal
3	NSYNC	—	Not used, open
4	X 2		
5	X 1		
6	V_{SS}	—	GND terminal
7	OSC 2	—	Not used, open
8	OSC 1	I	Clock signal
9	V_{DD}	I	Power supply terminal
10	NTC1B	I	Supply reel FG signal
11	NIRQ 0	I	Take-up reel FG signal
12	NIRQ 1	I	Transfer strobe signal of system control
13	P00 (MSTB)		
14	P 01 (MRDY)	O	Transfer ready signal of system control
15	P 02 (NSSTB)	O	Transfer strobe signal
16	P 03 (NSRDY)	I	Transfer ready signal
17	P 10 (ATFGT)	O	ATF gain (× 1/2) select terminal
18	P 11 (REWGT)	O	REW FG • PG gain select terminal
19	P 12 (LPMOD)	—	Not used, open
20	P 13 (MODMT0)	O	Mode motor control signal
21	P 20 (MODMT1)		
22	P 21 (MODMT2)		
23	P 22	—	Not used, open
24	P23 (PLG)	O	Plunger control signal
25	P 30	—	Not used, open
26	P 31		
27	P 32 (LOAD 1)	O	Tray motor control (+) terminal
28	P 33 (LOAD 2)	O	Tray motor control (−) terminal
29	P 40	—	Not used, open
30	P 41 (DEW)	I	Dew sensor det. signal
31	P 42 (EOT)	I	Tape end det. signal
32	P 43 (BOT)	I	Tape begin det. signal
33	P 50 (OPEN)	I	Cassette open det. signal
34	P 51 (CLOSE)	I	Cassette close det. signal
35	P 52 (LOAD S)	I	Loading start det. signal
36	P 53 (LOAD E)	I	Loading stop det. signal
37	P 60 (SW 2)	O	Test terminal
38 ~ 40	P 61 (MMOD 0) ~ P 63 (MMOD 2)	I	Tape mode det. signal
41 ~ 44	P 70 (MBUS 0) ~ P 73 (MBUS 3)	I/O	Transfer bus terminal of system control
45	P 80 (RCC)	—	Not used, open
46	P 81 (FIL)	O	FILTER select signal
47	P 82 (ATFON)	—	Not used, open
48	P 83 (NSTBY)	—	Not used, open
49	P 90 (NSRST)	O	Reset signal
50	P 91 (LEDDRV)	O	Tape begin/end LED control signal
51	P 92 (PCMOK)	I	PCM playback det. signal
52	P 93 (SVAL 0)	I	ATF effective position setting terminal
53	NEXPS	I	Not used, connected to power supply
54	PA 0 (NSNCOK)	I	ATF sync. det. terminal
55	PA 1 (NLNOK)	I	Track linearity det. terminal
56	PA 2 (CAPER)	I	Capstan rotative direction command signal
57	PA 3	—	Not used, open
58	PB 0 (TH 1)	I	Tape hall det. signal
59	PB 1 (TH 2)		
60	NSBTB	I	Muting det. signal
61	NSBIB	I	Test terminal
62	NSBOB		
63	NSBTA (SCLK)	I	Serial transfer clock signal
64	NSBIA (SDAT)	I/O	Serial transfer data signal

- **IC301 (MN188161SDL): System control**

Pin No.	Mark	I/O Division	Function
1	V_{DD}	I	Power supply terminal
2 ~ 9	P 67 (SPDT 7) ~ P 60 (SPDT 0)	I/O	Signal processor transfer address and data bus terminal
10	P 57 (SPRDY)	I	Signal processor data transfer command signal
11	P 56 (PBLANK)	I	Blank skip select ("H": no skip, "L": skip)
12	P 55 (R3CP)	I	Frame sync. signal
13	P 54 (PMID6B)	—	Main ID6 select terminal
14	P 53 (PMID6A)		
15	P 52	I	Not used, connected to resistor
16	P 51	I	Not used, connected to resistor
17	P 50 (PDIOSEL)	I	D I/O select terminal ("H": AES/EBU, "L": IEC)
18	EXI	—	Not used, connected to GND
19	EXO	—	Not used, open
20	NRST 1	I	Reset signal ("L": RESET)
21	P 47 (NSERVRST)	O	Reset signal to servo block
22	P 46	—	Not used, open
23	P 45	—	
24	P 44	—	
25	P 43 (SLAD)	O	DIGITAL IN PLL/crystal select terminal ("L": PLL, "H": crystal)
26	P 42 (XCK32)	O	32kHz OSC control ("H": OSC, "L": STOP)
27	P 41 (XCK44)	O	44.1KHz OSC control ("H": OSC, "L": STOP)
28	P 40 (XCK48)	O	48kHz OSC control ("H": OSC, "L": STOP)
29	P 27 (NPRDY)	I	Transfer ready signal from panel control
30	OSC 1	I	Crystal OSC terminal
31	OSC 2	O	
32	V_{SS}	—	GND terminal
33	XI	—	Not used, open
34	XO	—	
35	P 26	—	Not used, connected to power supply
36	P 25 (RF ENV)	I	RF envelope signal
37	P 37 (FLGCLK)	O	Clock signal of flag counter
38	P 36 (FLGDT)	O	Data signal of flag counter
39	P 35 (TP)	O	Track pitch signal ("L": normal)
40	P 34 (UNLOCK)	O	DIGITAL-IN PLL unlock signal ("L": det.)
41	P 33	—	Not used, open
42	P 32 (DISCHG)	O	DIGITAL-IN PLL discharge signal
43	P 31 (DINPLINH)	O	DIGITAL-IN PLL prohibition signal ("H": prohibition)
44	P 30 (ANRST)	O	Reset signal ("H": RESET) to DAC
45	P 21 (HSW)	I	Head switching pulse signal
46	P 20 (NMRDY)	I	Transfer command signal from mechanism control
47	P 01	—	Not used, open
48	P 00	—	
49	P 17 (PTXD)	O	Serial data transmission terminal
50	P 16 (PRXD)	I	Serial data reception terminal
51	P 15 (PCLK)	O	Serial data transmission/reception clock signal
52	P 14	—	Not used, open
53 ~ 56	P 13 (MDT 3) ~ P 10 (MDT 0)	I/O	Transfer data bus of mechanism control
57	P 77	—	Not used, open
58	P 76 (NDEMP)	O	de-emphasis signal
59	P 75 (SGMTG)	O	Muting signal
60	P 74 (DOUTTH)	O	Digital out through select ("H": through)
61	P 73 (NRST 2)	O	Reset signal
62	P 72 (MSTB)	O	Transfer command terminal of mechanism control
63	P 71 (SPSTB)	O	Signal processor strobe signal
64	P 70 (SPAW)	O	Signal processor address setting signal

• IC351 (MN6624): Digital signal processor

Pin No.	Mark	I/O Division	Function
1	PCMCIF	O	Flag counter terminal
2	IDPP		
3	IDP	O	Test terminal
4	V_{DD}	I	Power supply terminal
5	TESTS	—	Not used, connected to GND
6	V_{SS}	—	GND terminal
7	CKIO FS	—	Not used, open
8	CKIO 128	O	Test terminal
9	CKIO 512	—	Not used, open
10	NDALOAD	—	Not used, open
11	DADAT	O	DA data signal
12	DALRCK	O	LR discrimination signal
13	DABCK	O	Serial bit clock signal
14	DAMCK	—	Not used, open
15	V_{DD}	I	Power supply terminal
16	TEST 6	—	Not used, open
17	V_{SS}	—	GND terminal
18	ADDAT	I	AD data signal
19	ADLRCK	O	LR discrimination signal
20	ADBCK	O	Serial bit clock signal
21	ADMCK	O	External clock signal
22	TX	O	Digital signal
23	RX	I	
24	VCOS L32	—	Not used, open
25	VCOS L44		
26	VCOS L48		
27	DIO REF	O	Digital signal (PLL control)
28	DIO VAR	O	
29	V_{DD}	I	Power supply terminal
30	DI 512	I	Digital signal (512FS)
31	V_{SS}	—	GND terminal
32	XO 4	—	Not used, open
33	XI 4	I	Crystal terminal (32kHz×512)
34	TEST 0	—	Not used, connected to GND
35	XO 3	—	Not used, open
36	XI 3	I	Crystal terminal (44.1kHz×512)
37	TEST 1	—	Not used, connected to GND
38	XO 2	—	Not used, open
39	XI 2	I	Crystal terminal (48kHz×512)
40	V_{DD}	I	Power supply terminal
41	XO 1	O	Crystal OSC terminal
42	XI 1	I	
43	V_{SS}	—	GND terminal
44	PC OUT	—	Not used, open
45	RAD 0	O	RAM address bus termainal
46	RAD 1		
47	RAD 2		
48	RAD 3		
49	RAD 4		
50	RAD 5		
51	RAD 6		
52	RAD 7		
53	V_{DD}	I	Power supply terminal
54	TEST 2	—	Not used, connected to GND
55	V_{SS}	—	GND terminal
56	RAD C	O	RAM address bus terminal
57	RAD E		
58	NWE	O	Write enable for memory
59	RAD D	O	RAM address bus terminal
60	RAD 8		
61	RAD 9		
62	RAD B		
63	NOE	O	Output enable for memory
64	RAD A	O	RAM address bus terminal
65	V_{DD}	I	Power supply terminal
66	NCS	O	Chip select terminal for memory
67	V_{SS}	—	GND terminal
68	RDT 7	I/O	RAM data bus terminal
69	RDT 6		
70	RDT 5		
71	RDT 4		
72	RDT 3		
73	RDT 2		
74	RDT 1		
75	RDT 0		
76	V_{SS}	—	GND terminal
77	TEST 3	—	Not used, connected to GND
78	V_{DD}	I	Power supply terminal
79	SPDT 7	I/O	Address and data bus terminal
80	SPDT 6		
81	SPDT 5		
82	SPDT 4		
83	SPDT 3		
84	SPDT 2		
85	SPDT 1		
86	SPDT 0		
87	V_{SS}	—	GND terminal
88	TEST 4	—	Not used, connected to GND
89	V_{DD}	I	Power supply terminal
90	SPAW	I	Signal processor address setting terminal
91	SPSTB	I	Signal processor strobe signal
92	SPRDY	O	Data transfer command signal
93	UNLOK	O	PLL unlock signal
94	DISYND	—	Not used, open
95	NSTBY	I	Not used, connected to power supply
96	NRST	I	Reset signal
97	M7CK	—	Master clock signal (Not used, open)
98	R6CP/(ENVT)	O	Timing signal for RF envelope signal control
99	R3CP		
100	V_{SS}	—	GND terminal
101	SRRF	O	Recording signal
102	V_{DD}	I	Power supply terminal
103	SRPR	O	Recording/playback select signal (REC: "H", PLAY: "L")
104	SRWND 2	O	ATF area det. signal
105	SRWND 1	O	Track pitch signal
106	PBDT	I	Playback signal
107	PBCK	I	Playback envelope signal
108	RFMSK	O	Not used, open
109	PLLOFS	O	PLL off-set information signal
110	HFCH	O	System clock signal
111	VFPLFS	O	PLL OFS effective information signal
112	EXFCH	—	Not used, connected to GND
113	EEMD	—	Not used, connected to GND
114	V_{SS}	—	GND terminal
115	SL NRZI	—	Not used, connected to GND
116	SELF CH0		
117	SELF CH1		
118	V_{DD}	I	Power supply terminal
119	M9CP	O	Master clock signal
120	HSW	I	Head switching signal
121	NR TRST	—	Not used, connected to power supply
122	SUBWND	—	Not used, open
123	IPF	O	Output terminal for flag counter
124	SUBC 1		

• IC501 (YM3404B): Digital filter

Pin No.	Mark	I/O Division	Function
1	SHL	O	1 DAC (ST="L"): Lch Deglitcher signal 2 DAC (ST="H"): L/Rch Deglitcher signal
2	X 0	O	Clock output
3	X 1	I	Clock input
4	VDD 2	I	Power supply terminal
5	BCI	I	Bit clock signal
6	SDSY	I	R/L signal
7	SDI	I	Data input
8	VCC 1	I	Power supply terminal
9	DLO	O	1 DAC (ST="L"): L/Rch data output terminal 2 DAC (ST="H"): Lch data output terminal
10	RDO	O	Rch data output (Not used, open)
11	WCO	O	Output data word clock
12	BCO	O	Bit clock signal
13	VSS	I	GND terminal
14	ST	I	1 DAC/2 DAC selector terminal
15	FEN	I	System clock selector terminal
16	SHR	O	1 DAC (ST="L"): R ch deglitch signal

• IC502 (MN53010PEH): Serial/Parallel converter

Pin No.	Mark	I/O Division	Function			
1	WCO	O	Output data word clock (DALO, DBLO, DARO, DBRO)			
2	DARO	O	Rch data output, (+) terminal			
3	DBRO	O	Rch data output, (−) terminal			
4	RST	I	Reset terminal, input data to "0"			
5	SVDD	I	Power supply terminal			
6	SVSS	I	GND terminal			
7	F2DAC	I	"H": 2DAC 18-bit "L": 2DAC 17-bit			
8	FLOAT	I	"H": 4DAC 18-bit "L": 4DAC 17-bit			
9	PHASE	I	"H": Phase inversion "L": Normal mode			
10	LRCK	I	Inverter input			
11	NLRCK	O	LRCK signal inverter output			
12	SIN	I	Data input			
13	WCI	I	Input data word clock			
14	BCI	I	Input data bit clock			
15	VSS	I	GND terminal			
16	NC	—	Not connected			
17	VDD2	I	Power supply terminal			
18	SHR	I	Rch Deglitcher signal			
19	SHL	I	Lch Deglitcher signal			
20 ∫ 31	NC	—	Not connected			
			NORMAL MODE delay: 180ms	TEST MODE delay: 1.45ms	TEST MODE delay: 0.73ms	TEST MODE delay: 0ms
32	NTEST 1	I	H	L	H	L
33	NTEST 2	I	H	H	L	L
34	NTEST 3	I	"H": Normal mode "L": Reset			
35	DALO	O	Lch data output, (+) terminal			
36	DBLO	O	Rch data output, (−) terminal			
37	VDD	I	Power supply terminal			
38	VSS2	I	GND terminal			
39	NC	—	Not connected			
40	GAIN	O	Gain selector signal [H: 0∼−12dB L: below −12dB]			
41	SH	O	Deglitch signal {H: sample L: Hold}			
42	BCO	O	Output data bit clock			

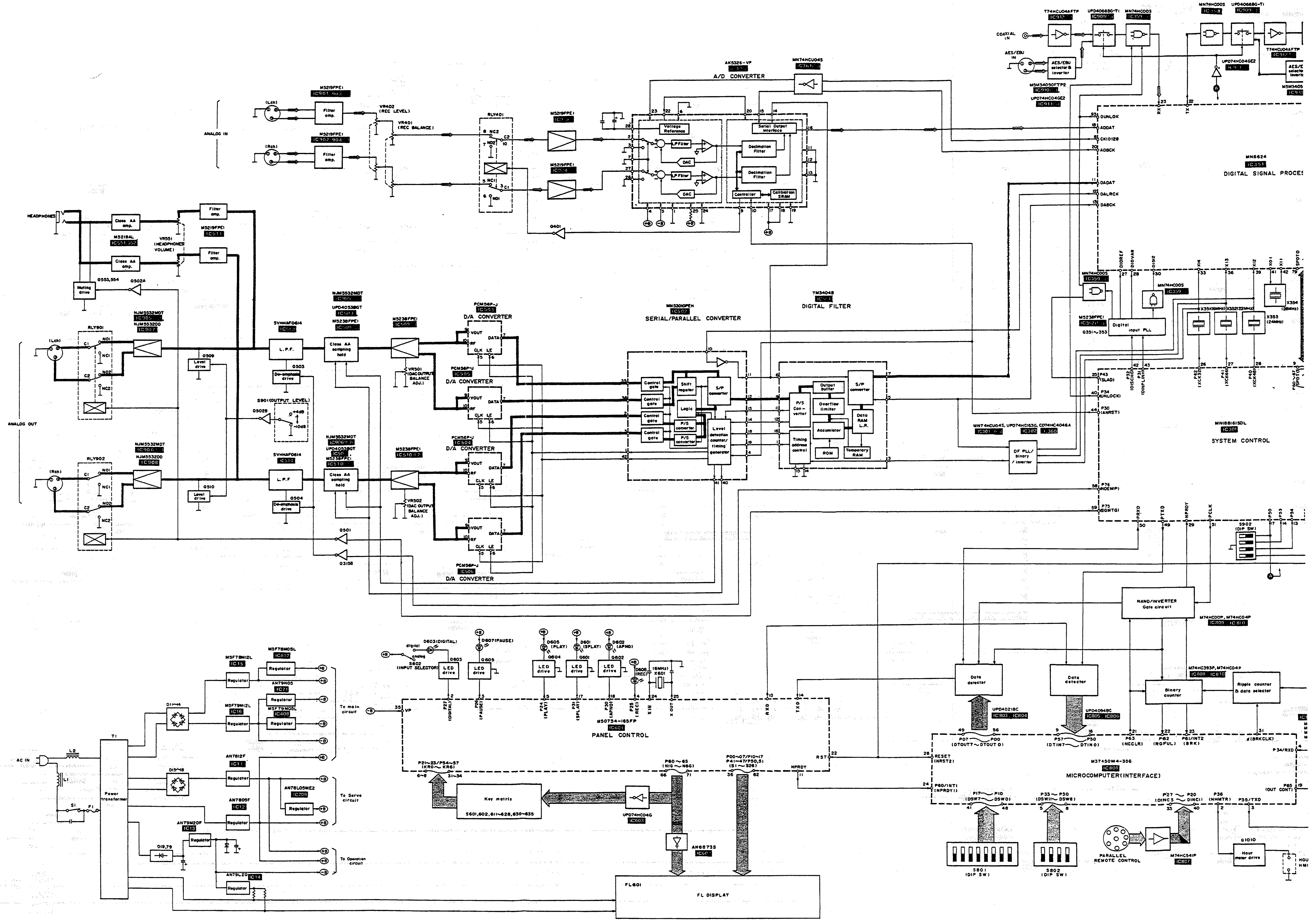
• IC503∼IC506 (PCM56P-J): D/A converter

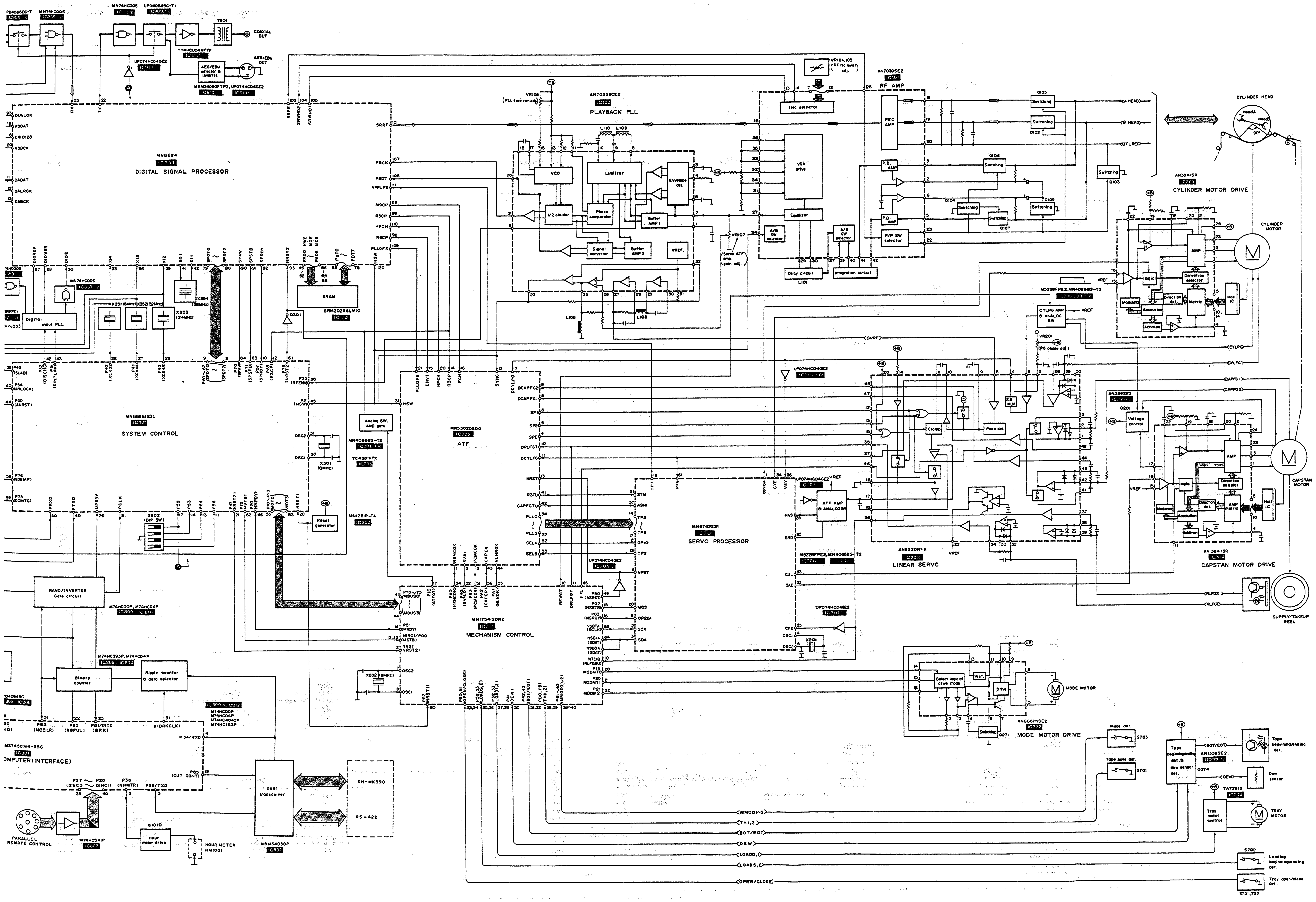
Pin No.	Mark	I/O Division	Function
1	−VS	I	Power supply terminal
2	DG	—	GND terminal
3	+VL	I	Power supply terminal
4	NC	—	Not connection
5	CLK	I	Clock signal
6	LE	I	Latch enable control signal
7	DATA	I	Data signal
8	−VL	I	Power supply terminal
9	V OUT	O	Voltage output termial
10	RF	O	Data signal
11	SJ	I	Operation amp. supply terminal
12	A • G	—	GND terminal
13	I OUT	O	Current output termial
14	MSB	I	MSB adj. terminal (Not used, open)
15	R IN	—	Not used, open
16	+VS	I	Power supply terminal

- **IC601 (M50754-165FP): Panel control & FL drive**

Pin No.	Mark	I/O Division	Function
1	V_{SS}	—	GND terminal
2	P 27	O	Input select signal (DIGITAL↔ANALOG)
3	P 26	O	LED display drive terminal (PAUSE)
4	P 25	O	LED display drive terminal (REC)
5	P 24	O	LED display drive terminal (PLAY)
6 ~ 8	P 23 ~ P 21	I	Key return signal
9	P 20	O	Buffer control signal
10	NC	—	Not connection
11	NPRDY	O	Ready signal
12	NTRCLK	I/O	Serial data transmission/ reception clock signal
13	RXD	O	Serial data transmission signal
14	TXD	I	Serial data reception signal
15	P 33	—	Not connection
16	P 32		
17	P 31	O	LED display drive terminal (S. PLAY)
18	P 30	O	LED display drive terminal (A. PNO)
19	INT 1	I	Remote control signal
20	INT 2	I	Not used, connected to power supply
21	CNV$_{SS}$	—	GND terminal
22	RST	I	Reset signal ("L": RESET)
23	NC	—	Not connection
24	X IN	I	Master clock terminal (6 MHz)
25	X OUT	O	
26	NC	—	Not connection
27	X CIN	—	Not used, connected to GND
28	X COUT	—	Not used, open
29	V_{SS}	—	GND terminal
30	NC	—	Not connection
31	P 57	I	Key return signal
32	P 56		
33	P 55	I	Key return signal
34	P 54		
35	VP	I	Power supply terminal for FL drive
36	P 51	O	Segment signal for FL drive
37	P 50		
38 ~ 45	P 17 ~ P 10		
46	NC	—	Not connection
47	P 07	O	Segment signal for FL drive
48	P 06		
49	P 05		
50	P 04		
51	P 03		
52	P 02		
53	P 01		
54	P 00		
55	P 47		
56	P 46		
57	P 45		
58	P 44		
59	P 43		
60	P 42		
61	P 41		
62	P 40		
63	V_{CC}	I	Power supply terminal
64	V_{CC}		
65	V_{SS}	—	GND terminal
66	P 65	O	Digit signal for FL drive and key scan signal
67	P 64		
68	P 63		
69	P 62		
70	P 61		
71	P 60		
72	NC	—	Not connection

■ BLOCK DIAGRAM

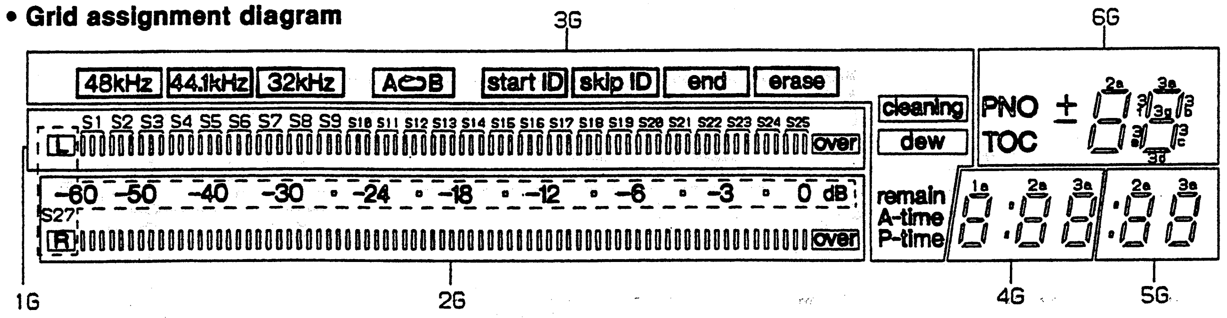

ANALOG IN
(Lch)
(Rch)
M5219FPE1
IC901, 903
M5219FPE1
IC902, 904
Filter amp.
VR402 (REC LEVEL)
VR401 (REC BALANCE)
RLY401
NC2
NO2
C2
NC1
C1
NO1
M5219FPE1
Q401
AK5326-VP
A/D CONVERTER
Voltage Reference
LP Filter
DAC
Serial Output interface
Decimation Filter
Controller
Calibration SRAM
MN74HCU04S
IC361
COAXIAL IN
AES/EBU IN
AES/EBU selector & inverter
T74HCU04AFTP
IC912
UPD40668G-T1
IC909
MN74HC00S
IC359
M5M34050FTP2
IC910
UPD74HC04GE2
IC911
RX
TX
DUNLOK
ADDAT
CKIO128
ADBCK
DADAT
DALRCK
DABCK
MN6624
IC351
DIGITAL SIGNAL PROCES
DIOREF
DIOVAR
DIS12
XI4
XI3
XI2
XO1
XI1
SPDTO
Digital input PLL
M5238FPE1
Q351~353
X351(16MHz)
X352(22MHz)
X353 (24MHz)
X354 (28MHz)
P43 (SLAD)
P34 (UNLOCK)
P30 (ANRST)
P32 (DISCHG)
P31 (DINPLINH)
P42 (XCK32)
P41 (XCK44)
P40 (XCK48)
P60~67 (SPDTO)
MN74HCU04S, UPD74HC163G, CD74HC4046A
IC301
IC302
IC360
DF PLL/ binary / inverter
MN188161SDL
IC301
SYSTEM CONTROL
P76 (NDEMP)
P75 (SGMTG)
PRXD
PTXD
NPRDY
PCLK
P50
P53
P54
S902 (DIP SW)
HEADPHONES
Class AA amp.
M5218AL
IC551, 552
VR551 (HEADPHONES VOLUME)
Filter amp.
M5219FPE1
IC511
Muting drive
Q553,554
Q502A
ANALOG OUT
RLY901
RLY902
NJM5532MDT
IC905
NJM5532DD
IC907
NJM5532MDT
IC906
NJM5532DD
IC908
Level drive
Q509
Q510
SVHHAF0614
IC513
IC514
L.P.F.
De-emphasis drive
Q503
Q504
S901 (OUTPUT LEVEL)
Q502B
+4dB
-10dB
NJM5532MDT
UPD4053BGT
IC507
M5238FPE1
IC509
IC510
Class AA sampling hold
VR501 (DAC OUTPUT BALANCE ADJ.)
VR502 (DAC OUTPUT BALANCE ADJ.)
Q501
Q315B
PCM56P-J
IC503
IC505
IC504
IC506
D/A CONVERTER
VOUT
RF
DATA
CLK
LE
MN53010PEH
IC502
SERIAL/PARALLEL CONVERTER
Control gate
Shift register
S/P converter
Logic
P/S converter
Level detection counter/ timing generator
YM3404B
DIGITAL FILTER
P/S Con-verter
Output buffer
Overflow limiter
Accumlator
Data RAM L.R.
Timing address control
ROM
Temporary RAM
NAND/INVERTER Gate circuit
M74HC00P, M74HC04P
IC809, IC810
Data detector
UPD4021BC
IC803, IC804
UPD4094BC
IC805, IC806
Binary counter
M74HC393P, M74HC04P
IC808, IC810
Ripple counter & data selector
P07~P00 (DTOUT7~DTOUT0)
P57~P50 (DTIN7~DTIN0)
P63 (NCCLR)
P62 (RGFUL)
P61/INT2 (BRK)
(BRKCLK)
P34/RXD
RESET (NRST2)
M37450M4-356
IC801
MICROCOMPUTER(INTERFACE)
P60/INT1 (NPRDY1)
P65 (OUT CONT)
P17~P10 (DSW7~DSW0)
P33~P30 (DSW11~DSW8)
P27~P20 (DINC5~DINC1)
P36 (NHMTR)
P35/TXD
S801 (DIP SW)
S802 (DIP SW)
PARALLEL REMOTE CONTROL
M74HC541P
IC807
Q1010
Hour meter drive
AC IN
L1
L2
S1
F1
T1
Power transformer
D11~14
D15~18
D19,79
M5F78M12L
IC15
M5F78M05L
IC407
AN79N05
IC71
M5F79M12L
IC16
M5F79M05L
IC408
Regulator
To main circuit
AN7812F
IC11
AN78L05ME2
IC209
AN7805F
IC12
To Servo circuit
AN79M20F
IC13
AN79L20
IC14
To Operation circuit
+B
-B
D603(DIGITAL)
digital
analog
S602 (INPUT SELECTOR)
D607(PAUSE)
D605 (PLAY)
D601 (SPLAY)
D602 (APNO)
D606 (REC)
Q603
Q605
Q604
Q601
Q602
LED drive
(6MHz) X601
VP
P27 (DIGITAL)
P26 (PAUSE)
P24 (PLAY)
P31 (SPLAY)
P30 (APNO)
P25 (REC)
X IN
X OUT
RXD
TXD
M50754-165FP
IC601
PANEL CONTROL
RST
NPRDY
P21~23/P54~57 (KR0~KR6)
P60~65 (NIG~N6G)
P00~07/P10~17 P41~47/P50,51 (S1~S26)
Key matrix
S601,602,611~628,630~635
UPD74HC04G
IC603
AN6873S
IC602
FL601
FL DISPLAY
A


MN6624
IC351
DIGITAL SIGNAL PROCESSOR
MN18816ISDL
IC301
SYSTEM CONTROL
MN53020SDD
IC202
ATF
MN17541SDN2
MECHANISM CONTROL
MN6742SDR
IC701
SERVO PROCESSOR
AN7035SCE2
IC102
PLAYBACK PLL
AN7030SE2
IC101
RF AMP
AN3841SR
CYLINDER MOTOR DRIVE
CYLINDER HEAD
CYLINDER MOTOR
AN8320NFA
IC203
LINEAR SERVO
CAPSTAN MOTOR DRIVE
CAPSTAN MOTOR
SUPPLY/TAKEUP REEL
AN6607NSE2
IC272
MODE MOTOR DRIVE
MODE MOTOR
TRAY MOTOR
SRAM
SRM20256LM10
VCO
Limiter
Envelope det.
1/2 divider
Phase comparator
Buffer AMP 1
Buffer AMP 2
Signal converter
VREF.
Delay circuit
Integration circuit
VCA drive
Equalizer
A/B SW selector
REC AMP
P.B. AMP
R/P SW selector
Switching
Irec selector
Digital input PLL
Reset generator
NAND/INVERTER Gate circuit
Binary counter
Ripple counter & data selector
Dual transceiver
SH-MK390
RS-422
Hour meter drive
HOUR METER HM1001
PARALLEL REMOTE CONTROL
COMPUTER(INTERFACE)
COAXIAL OUT
AES/EBU OUT
AES/EBU selector & inverter
T901
S902 (DIP SW)
X301 (8MHz)
X202 (8MHz)
X201
Analog SW, AND gate
ATF AMP & ANALOG SW
CYLPG AMP & ANALOG SW
Voltage control
Clamp
Peak det.
Select logic of drive mode
Drive
Tape beginning/ending det. & dew sensor det.
Tray motor control
Tape beginning/ending det.
Dew sensor
Mode det. S703
Tape hole det. S701
S702 Loading beginning/ending det.
Tray open/close det. S751,752
A HEAD
B HEAD
BTLREC
SVRF
CYLPG
CYLFG
CAPFG1
CAPFG2
RLFGS
RLFGT
MMOD1~3
TH1,2
BOT/EOT
DEW
LOADO,I
LOADS,E
OPEN/CLOSE
Direction selector
Direction det.
Logic
Modulator
Absolution
Addition
AMP
Matrix
Hall IC
VR104,105 (RF rec level adj.)
VR106 (PLL free run adj.)
VR107 (Servo ATF amp. gain adj.)
VR201 (FG phase adj.)

Note)
- ⟹ (shaded) : Playback signal
- ⟹ : Recording signal

INTERNAL CONNECTION OF FL

- **Grid assignment diagram**


3G
6G
48kHz
44.1kHz
32kHz
A⊂⊃B
start ID
skip ID
end
erase
cleaning
dew
PNO
TOC
±
S1 S2 S3 S4 S5 S6 S7 S8 S9 S10 S11 S12 S13 S14 S15 S16 S17 S18 S19 S20 S21 S22 S23 S24 S25
L
over
-60 -50 -40 -30 -24 -18 -12 -6 -3 0 dB
S27
R
over
remain
A-time
P-time
1a 2a 3a 2a 3a
3g 3d
1G
2G
4G
5G

- **Anode connection table**

	1G	2G	3G	4G	5G	6G
S1	▮▮▮	▮▮▮	48KHz	-	-	-
S2	▮▮▮	▮▮▮	44.1KHz	-	-	-
S3	▮▮▮	▮▮▮	32KHz	-	-	-
S4	▮▮▮	▮▮▮	A	1a	-	-
S5	▮▮▮	▮▮▮	⊂⊃	1b	-	-
S6	▮▮▮	▮▮▮	B	1f	-	-
S7	▮▮▮	▮▮▮	start ID	1g	-	PNO
S8	▮▮▮	▮▮▮	skip ID	1c	-	TOC
S9	▮▮▮	▮▮▮	end	1e	-	+
S10	▮▮▮	▮▮▮	erase	1d	-	–
S11	▮▮▮	▮▮▮	-	col,1	col,2	-
S12	▮▮▮	▮▮▮	-	2a	2a	2a
S13	▮▮▮	▮▮▮	cleaning	2b	2b	2b
S14	▮▮▮	▮▮▮	dew	2f	2f	2f
S15	▮▮▮	▮▮▮	-	2g	2g	2g
S16	▮▮▮	▮▮▮	remain	2c	2c	2c
S17	▮▮▮	▮▮▮	A-time	2e	2e	2e
S18	▮▮▮	▮▮▮	P-time	2d	2d	2d
S19	▮▮▮	▮▮▮	-	-	-	-
S20	▮▮▮	▮▮▮	-	3a	3a	3a
S21	▮▮▮	▮▮▮	-	3b	3b	3b
S22	▮▮▮	▮▮▮	-	3f	3f	3f
S23	▮▮▮	▮▮▮	-	3g	3g	3g
S24	▮▮▮	▮▮▮	-	3c	3c	3c
S25	▮▮▮	▮▮▮	-	3e	3e	3e
S26	over	over	-	3d	3d	3d
S27	L	R -60~0 dB	-	-	-	-

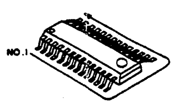
- **Pin connection**

PIN NO.	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41
CONNECTION	F2	F2	NP	NP	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11

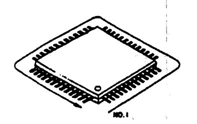
PIN NO.	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
CONNECTION	S12	S13	S14	S15	S16	S17	S18	S19	S20	S21	S22	S23	S24	S25	S26	S27	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	1G	2G	3G	4G	5G	6G	NP	NP	F1	F1

Note 1.)NP………… No pin.
2.)F1,F2……… Filament
3.)1G~6G…… Grid.

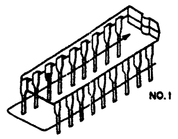
TERMINAL GUIDE OF IC'S, TRANSISTORS AND DIODES



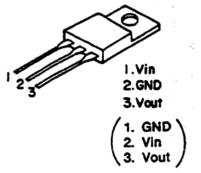
TC4S81FTX	5 pin	AN3841SR	24 pin
M5219FPE1 M5238FPE1 NJM5532MDT	8 pin	AN6607NSE2 UPD74HC163G M5M34050FTP2 UPD4053BGT	16 pin
AN1339SE2 UPD74HC04G UPD74HC04GE2 MN74HCU04S MN4066BS-T2 MN74HC00S T74HCU04AFTP UPD4066BG-T1 M5228FPE2	14 pin	AN6873S	18 pin
		SRM20256LM10	28 pin
		AN7035SCE2	32 pin
		AN7030SE2	42 pin



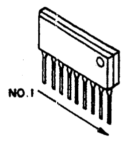
MN53010PEH	42 pin
AN8320NFA	48 pin
MN6742SDR MN17541SDN2	64 pin
M50754-165FP	72 pin
MN53020SDQ	44 pin
MN6624	124 pin



NJM5532DD	8 pin	M74HC541P	20 pin
M74HC00P M74HC04P M74HC393P	14 pin	AK5326-VP	28 pin
		MN188161SDL M37450M4-356	64 pin
CD74HC4046A PCM56P-J YM3404B UPD4021BC UPD4094BC M74HC153P M74HC4040P M5M34050P	16 pin		

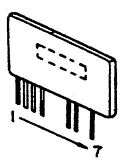

1
2
3
1.Vin
2.GND
3.Vout
1. GND
2. Vin
3. Vout

AN7812F AN7805F (AN79M20F) M5F78M12L (M5F79M12L) M5F78M05L (M5F79M05L)	3 pin

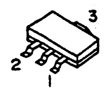


M5218AL	8 pin
TA7291S	9 pin

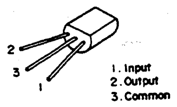
SVHHAF0614	7 pin



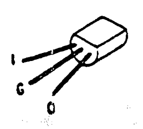
AN78L05ME2



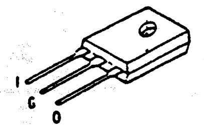
MN1281R-TA


2
3
1
1. Input
2. Output
3. Common

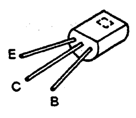
AN79L20



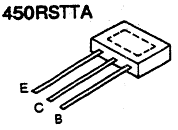
AN79N05



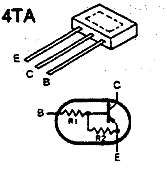
2SC1047DTA



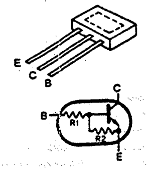
2SA1309STA
2SA1309QRSTA
2SC3311QRSTA
2SC3315CTA
2SD1450RSTTA



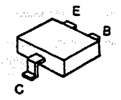
UN4124TA
UN4111TA
UN4114TA


E
C
B
C
B
R1
R2
E

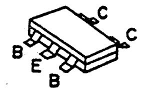
UN4212TA


E
C
B
C
B
R1
R2
E

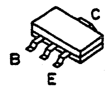
2SB709RTW DTA114EKTW
2SC3937TW DTB113ZKTW
UN5216TW
DTA123JKTW
DTC124EKTW



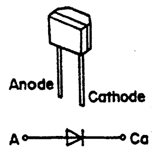
XN1112TW
XN1212TW

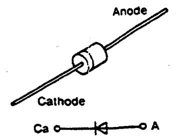


2SB956RTW
2SD1280STW



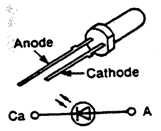
RVDSVC321


Anode
Cathode
A
Ca

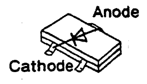

Anode
Cathode
Ca
A

1SR35200TB
MA165TA
SVDS2V20
1N4606TR
1S2473TR
MA719TA

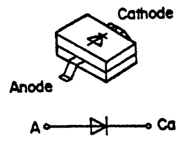
LN28RCPP-JF, LN31GPH-JF2
LN49YPH-JF1, LN29RPH-JF1


Anode
Cathode
Ca
A

MA151ATW


Anode
Cathode

MA701TW


Cathode
Anode
A
Ca

SCHEMATI

(Parts list on pages 8

(This schematic diagrar
development of new tec

Note 1:
- **S901** : Output l
- **S902** : DIP swit
- Resistance are in ohn
otherwise.
1K=1,000 (Ω), 1M=1,
- Capacity are in micro-
- All voltage values sho
condition and playbac
minimum position oth
( )………Voltage va
For measurement us
- Important safety notic
Components identifie
characteristics import
these components, us

Part No.	Origi
IC551, 552	M52

- (━━━) indicates
- (▬ ▬ ▬) indicates
- (⇢) indicates
- (⇨) indicates

∗ Caution!

IC and LSI are sensitive
Secondary trouble can
repair.
∗ Cover the parts boxes
∗ Ground the soldering
∗ Put a conductive mat
∗ Do not touch the legs

■ SCHEMATIC DIAGRAM

(Parts list on pages 86~88, 98~100.)

(This schematic diagram may be modified at any time with development of new technology.)

Note 1:

- **S901** : Output level selector switch (+4dBu/−10dBu).
- **S902** : DIP switch.
- Resistance are in ohms (Ω), 1/4 watt unless specified otherwise. 1K=1,000 (Ω), 1M=1,000k (Ω)
- Capacity are in micro-farads (μF) unless specified otherwise.
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position otherwise specified. ( ) ....Voltage values at recording mode. For measurement us EVM.
- Important safety notice Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

Part No.	Original Part No.	Supply Part No.
IC551, 552	M5218AL	M5218L

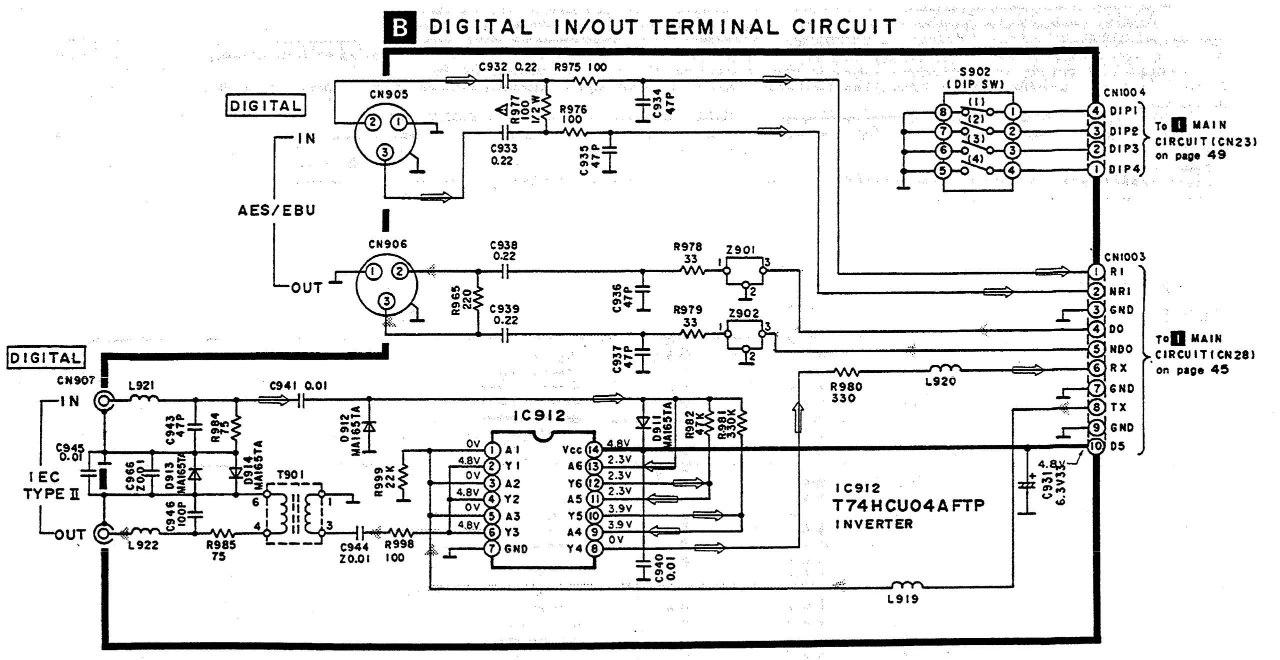
- (━━━) indicates +B (bias).
- (━ ━ ━) indicates −B (bias).
- (⇛) indicates the flow of the playback signal.
- (⟹) indicates the flow of the recording signal.

∗Caution!

IC and LSI are sensitive to static electricity.
Secondary trouble can be prevented by taking care during repair.

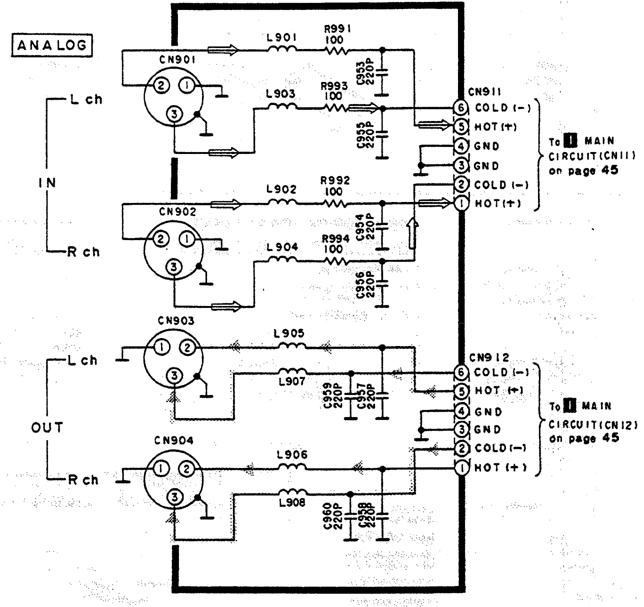
∗ Cover the parts boxes made of plastics with aluminum foil.
∗ Ground the soldering iron.
∗ Put a conductive mat on the the work table.
∗ Do not touch the legs of IC or LSI with the fingers directly.

B DIGITAL IN/OUT TERMINAL CIRCUIT



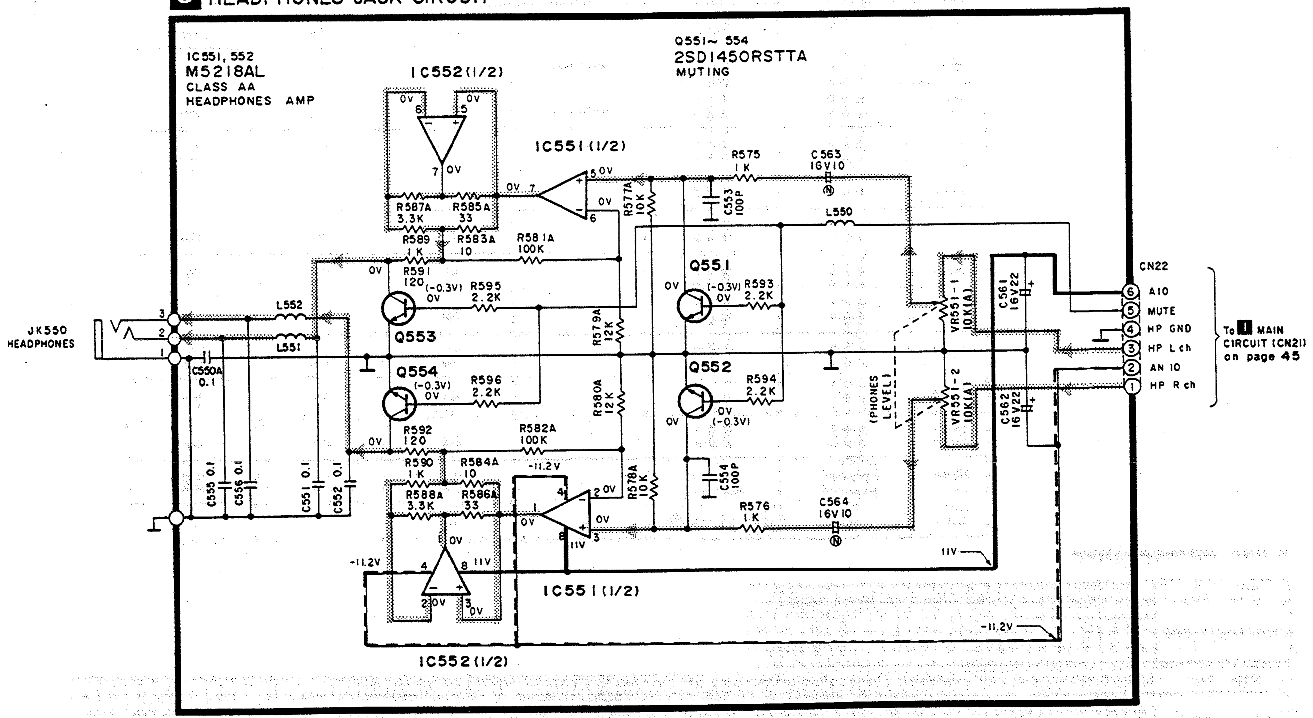
DIGITAL
IN
AES/EBU
OUT
CN905
CN906
CN907
IEC TYPE II
S902 (DIP SW)
CN1004
DIP1
DIP2
DIP3
DIP4
To I MAIN CIRCUIT (CN23) on page 49
CN1003
RI
NRI
GND
DO
NDO
RX
GND
TX
GND
DS
To I MAIN CIRCUIT (CN28) on page 45
IC912
IC912 T74HCU04AFTP INVERTER
T901
L919
L920
L921
L922

H ANALOG IN/OUT TERMINAL CIRCUIT

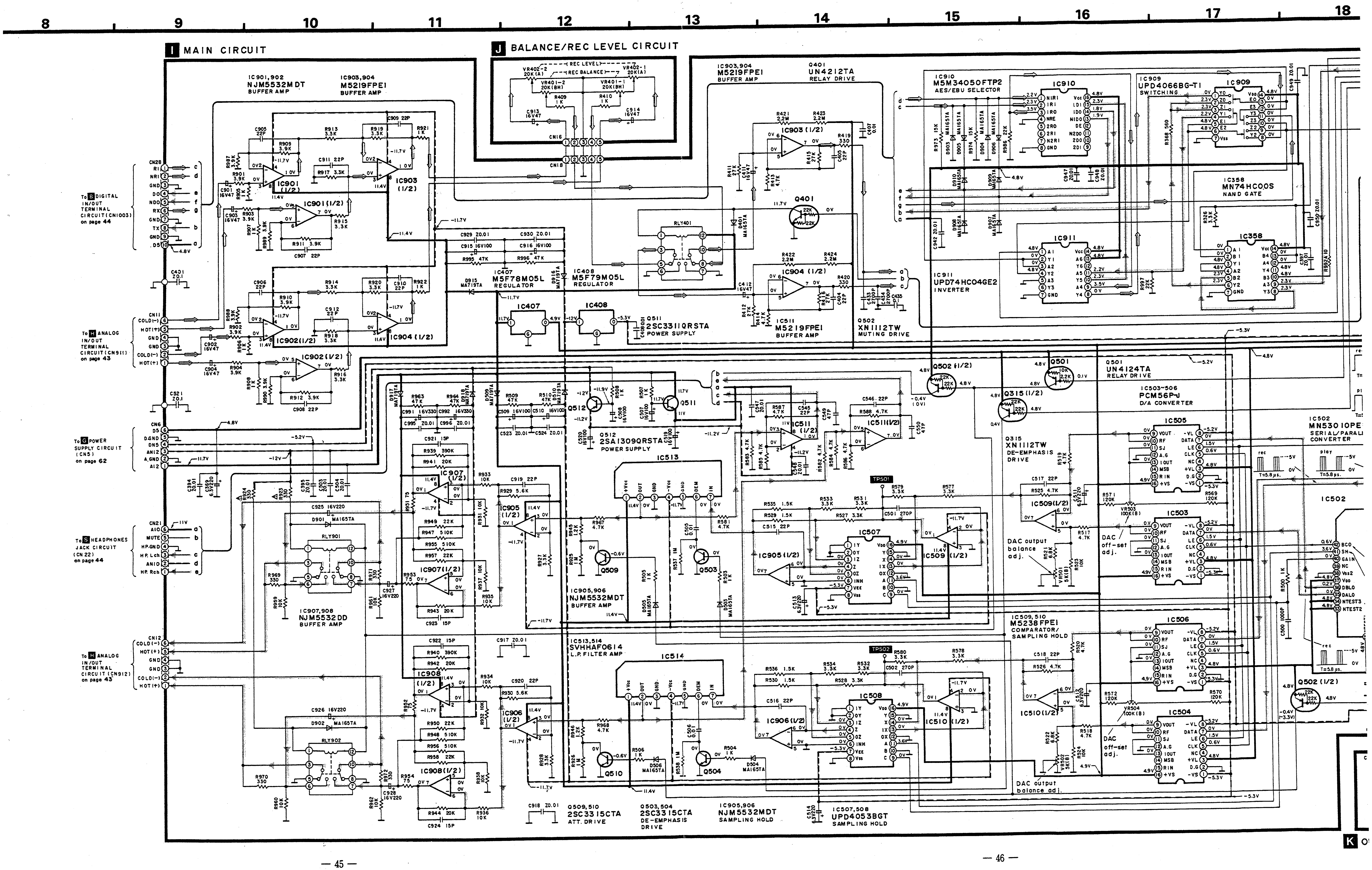


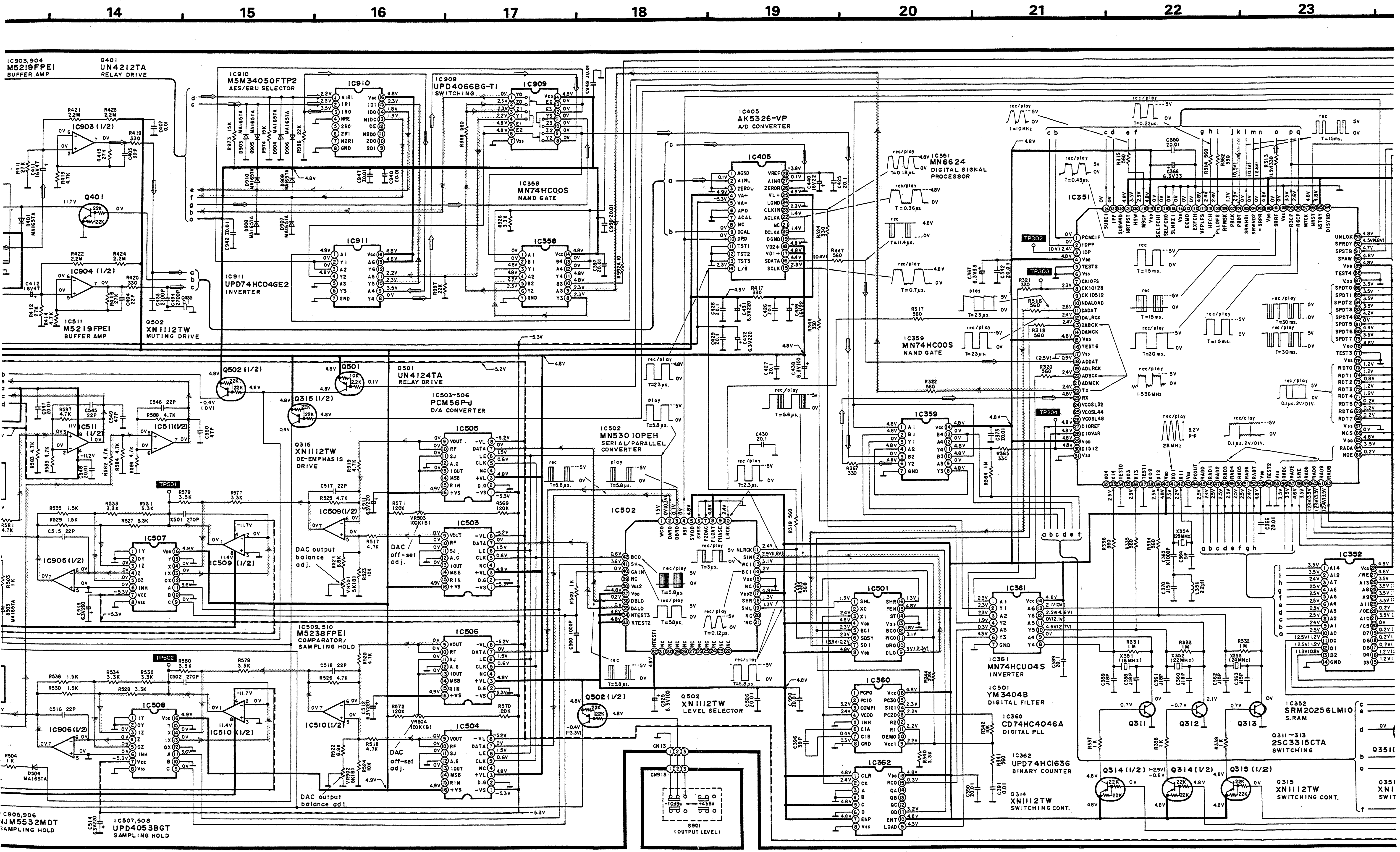
ANALOG
IN
OUT
L ch
R ch
CN901
CN902
CN903
CN904
CN911
CN912
COLD (−)
HOT (+)
GND
To I MAIN CIRCUIT (CN11) on page 45
To I MAIN CIRCUIT (CN12) on page 45

S HEADPHONES JACK CIRCUIT



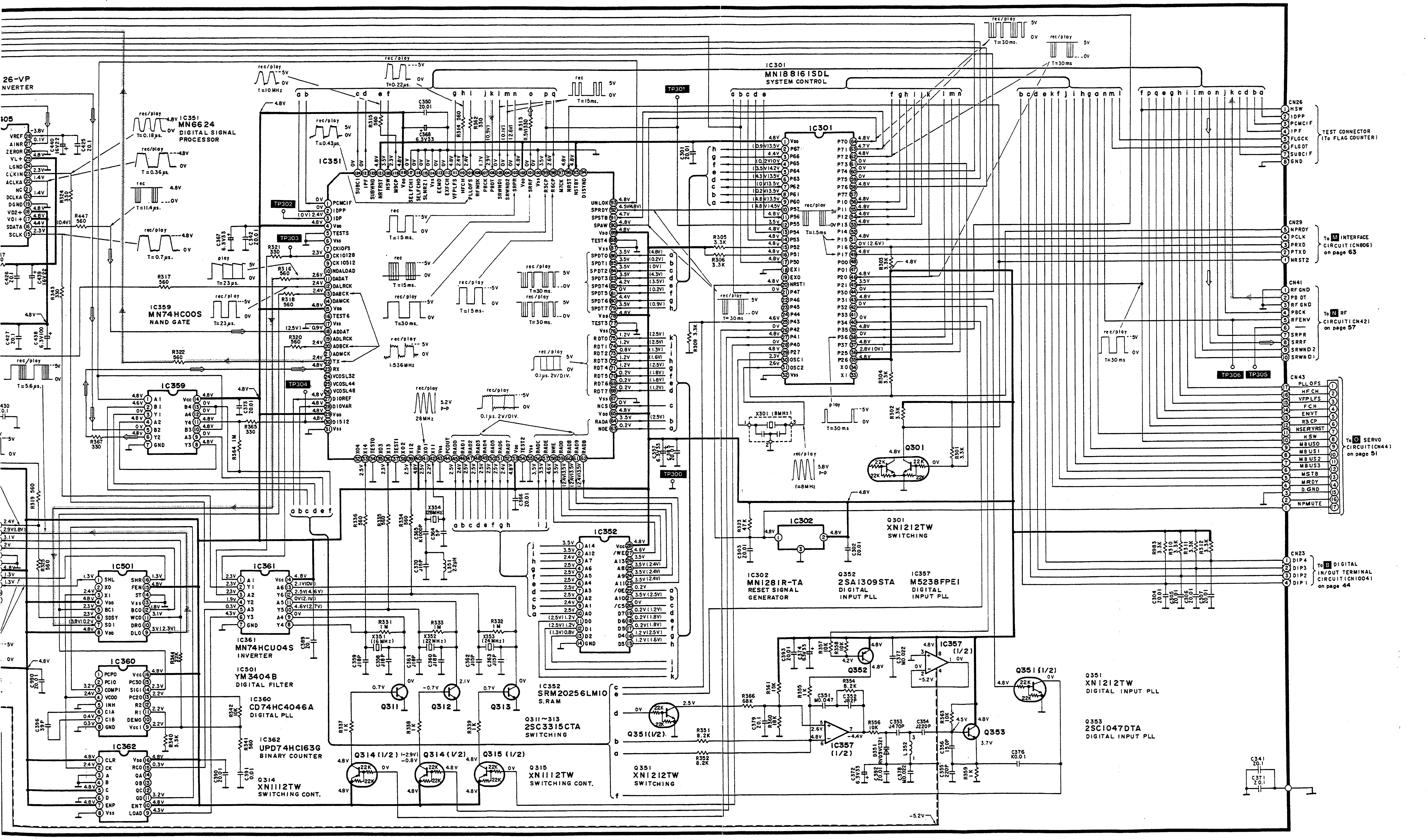
IC551, 552 M5218AL CLASS AA HEADPHONES AMP
Q551~554 2SD1450RSTTA MUTING
IC552 (1/2)
IC551 (1/2)
Q551
Q552
Q553
Q554
JK550 HEADPHONES
VR551-1
VR551-2
(PHONES LEVEL)
CN22
A10
MUTE
HP GND
HP L ch
AN 10
HP R ch
To I MAIN CIRCUIT (CN21) on page 45


8
9
10
11
12
13
14
15
16
17
18
I MAIN CIRCUIT
J BALANCE/REC LEVEL CIRCUIT
IC901,902 NJM5532MDT BUFFER AMP
IC903,904 M5219FPEI BUFFER AMP
IC903,904 M5219FPEI BUFFER AMP
Q401 UN4212TA RELAY DRIVE
IC910 M5M34050FTP2 AES/EBU SELECTOR
IC909 UPD4066BG-T1 SWITCHING
IC358 MN74HC00S NAND GATE
IC911 UPD74HC04GE2 INVERTER
IC407 M5F78M05L REGULATOR
IC408 M5F79M05L REGULATOR
Q511 2SC3311QRSTA POWER SUPPLY
IC511 M5219FPEI BUFFER AMP
Q502 XN1112TW MUTING DRIVE
Q501 UN4124TA RELAY DRIVE
IC503~506 PCM56P-J D/A CONVERTER
IC502 MN5301OPE SERIAL/PARALLEL CONVERTER
Q512 2SA1309QRSTA POWER SUPPLY
Q315 XN1112TW DE-EMPHASIS DRIVE
IC513
IC514
IC507
IC508
IC503
IC504
IC505
IC506
IC502
RLY401
RLY901
RLY902
IC907,908 NJM5532DD BUFFER AMP
IC905,906 NJM5532MDT BUFFER AMP
IC513,514 SVHHAF0614 L.P. FILTER AMP
IC509,510 M5238FPEI COMPARATOR/SAMPLING HOLD
Q509,510 2SC3315CTA ATT. DRIVE
Q503,504 2SC3315CTA DE-EMPHASIS DRIVE
IC905,906 NJM5532MDT SAMPLING HOLD
IC507,508 UPD4053BGT SAMPLING HOLD
To B DIGITAL IN/OUT TERMINAL CIRCUIT (CN1003) on page 44
To H ANALOG IN/OUT TERMINAL CIRCUIT (CN911) on page 43
To G POWER SUPPLY CIRCUIT (CN5) on page 62
To S HEADPHONES JACK CIRCUIT (CN22) on page 44
To H ANALOG IN/OUT TERMINAL CIRCUIT (CN912) on page 43
CN28
CN11
CN6
CN21
CN12
CN16
CN18
VR402-2 20K(A)
VR402-1 20K(A)
VR401-2 20K(BH)
VR401-1 20K(BH)
REC LEVEL
REC BALANCE
DAC output balance adj.
DAC off-set adj.
TP501
TP502
rec
play
T=5.8μs.
K


14
15
16
17
18
19
20
21
22
23
IC903,904
M5219FPEI
BUFFER AMP
Q401
UN4212TA
RELAY DRIVE
IC903 (1/2)
IC904 (1/2)
IC511
M5219FPEI
BUFFER AMP
Q502
XN1112TW
MUTING DRIVE
IC910
M5M34050FTP2
AES/EBU SELECTOR
IC910
IC909
UPD4066BG-T1
SWITCHING
IC909
IC911
UPD74HC04GE2
INVERTER
IC911
IC358
MN74HC00S
NAND GATE
IC358
IC405
AK5326-VP
A/D CONVERTER
IC405
IC351
MN6624
DIGITAL SIGNAL
PROCESSOR
IC351
TP302
TP303
TP304
IC359
MN74HC00S
NAND GATE
IC359
Q501
UN4124TA
RELAY DRIVE
IC503~506
PCM56P-J
D/A CONVERTER
IC505
IC503
IC506
IC504
Q502 (1/2)
Q315 (1/2)
Q315
XN1112TW
DE-EMPHASIS
DRIVE
IC509 (1/2)
IC510 (1/2)
DAC output
balance
adj.
DAC
off-set
adj.
TP501
TP502
IC507
IC508
IC905 (1/2)
IC906 (1/2)
IC509,510
M5238FPEI
COMPARATOR/
SAMPLING HOLD
IC905,906
NJM5532MDT
SAMPLING HOLD
IC507,508
UPD4053BGT
SAMPLING HOLD
IC502
MN53010IPEH
SERIAL/PARALLEL
CONVERTER
IC502
Q502
XN1112TW
LEVEL SELECTOR
CN13
CN913
-10dBu
+4dBu
S901
(OUTPUT LEVEL)
IC501
IC360
IC362
IC361
IC361
MN74HCU04S
INVERTER
IC501
YM3404B
DIGITAL FILTER
IC360
CD74HC4046A
DIGITAL PLL
IC362
UPD74HC163G
BINARY COUNTER
Q314
XN1112TW
SWITCHING CONT.
Q311
Q312
Q313
Q314 (1/2)
Q315 (1/2)
IC352
IC352
SRM20256LM10
S.RAM
Q311~313
2SC3315CTA
SWITCHING
Q315
XN1112TW
SWITCHING CONT.
X351 (16MHz)
X352 (22MHz)
X353 (24MHz)
X354 128MHz

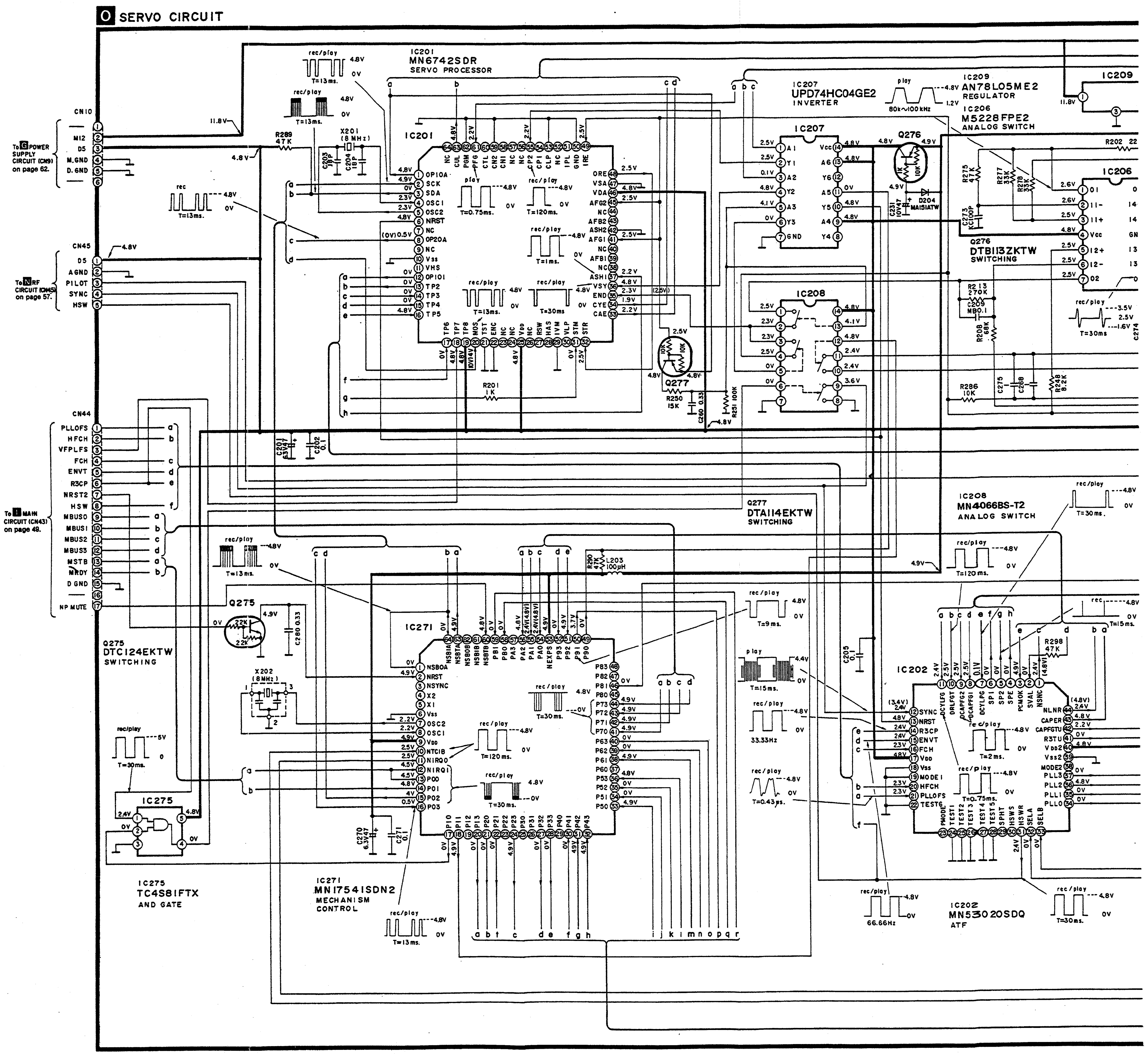
K OUTPUT LEVEL CIRCUIT

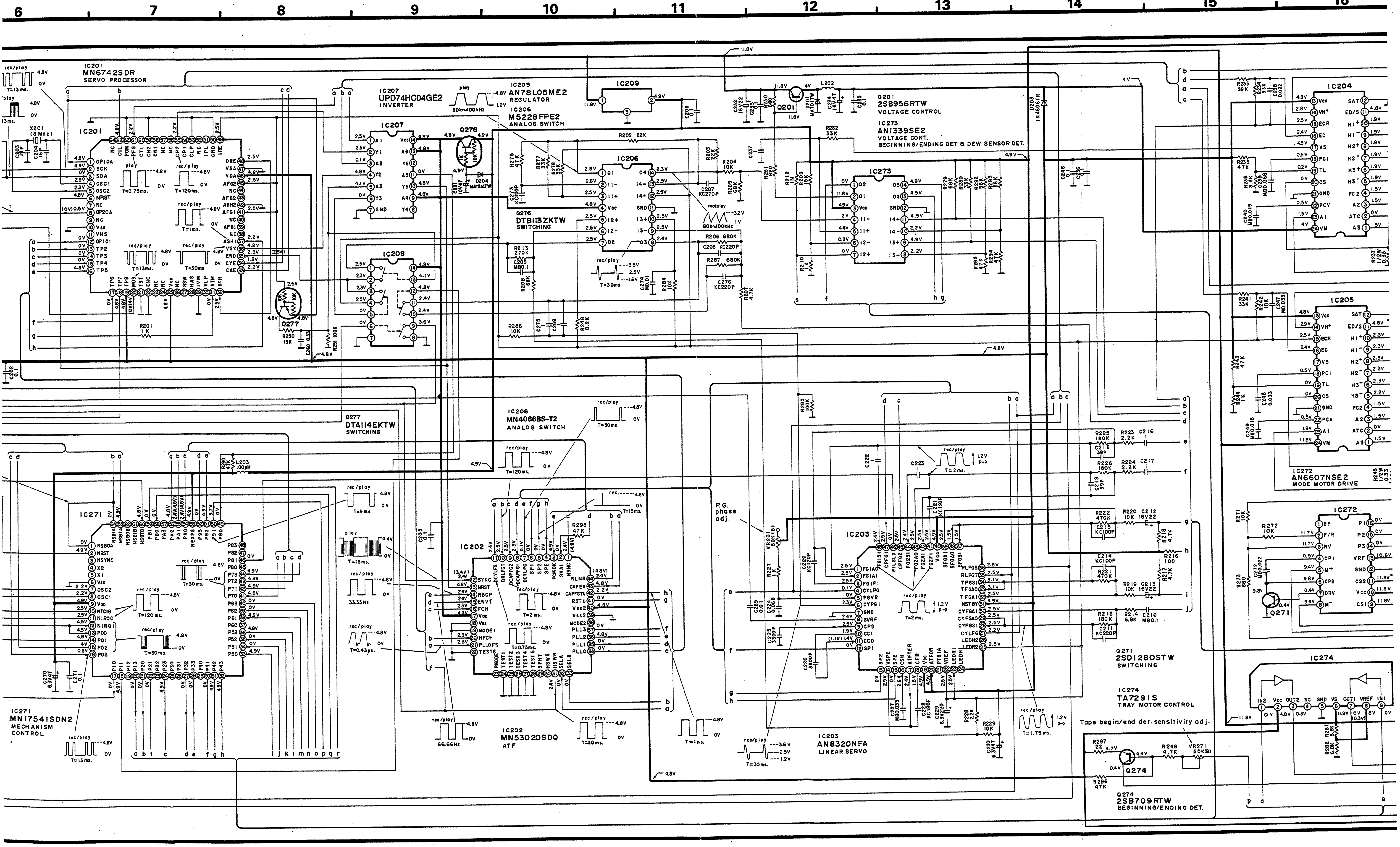
0

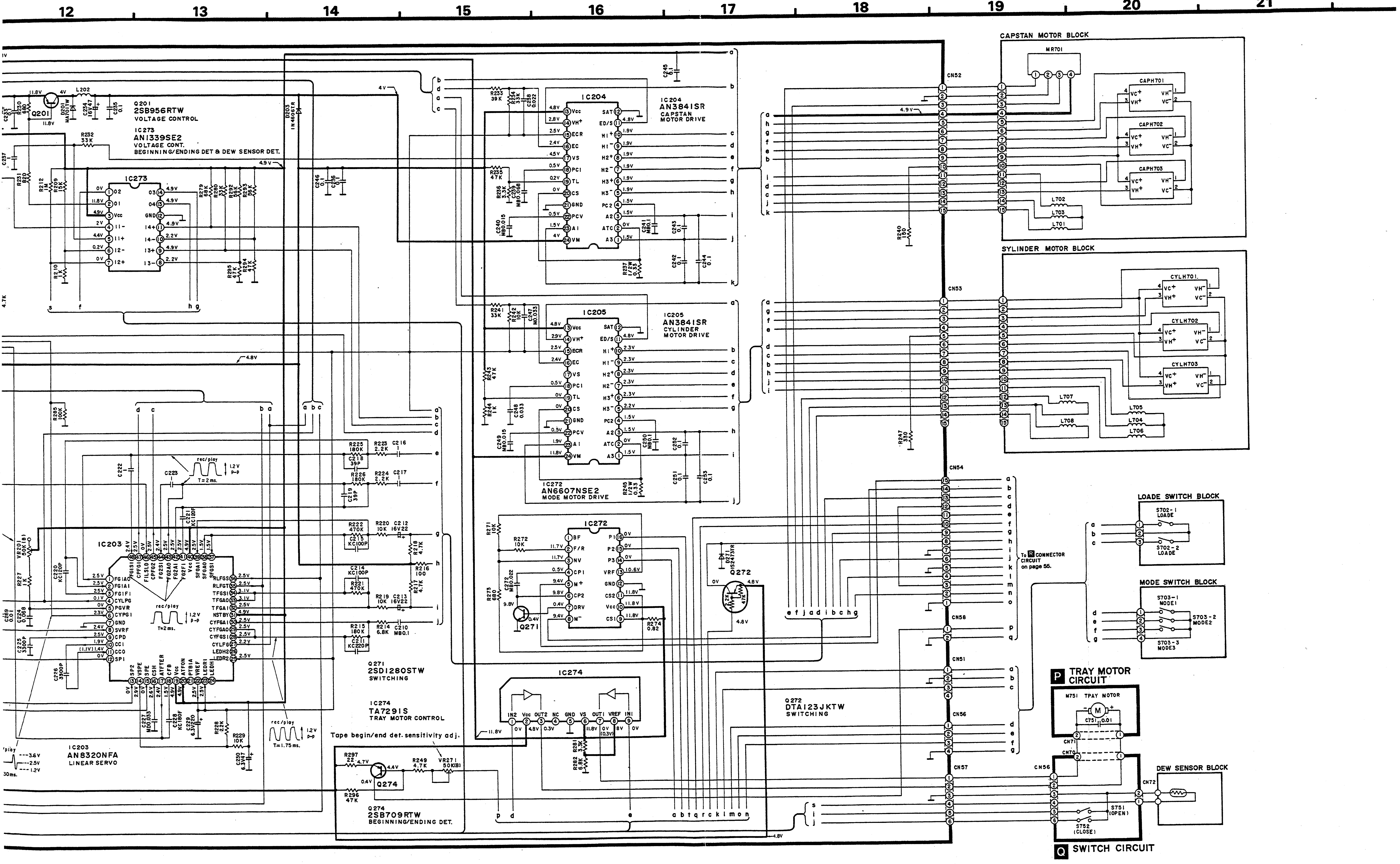

26-VP
NVERTER
IC351
MN6624
DIGITAL SIGNAL PROCESSOR
IC359
MN74HC00S
NAND GATE
IC301
MN188161SDL
SYSTEM CONTROL
TP301
TP302
TP303
TP304
TP300
TP306
TP305
X301 (8MHz)
IC302
MN1281R-TA
RESET SIGNAL GENERATOR
Q352
2SA1309STA
DIGITAL INPUT PLL
IC357
M5238FPE1
DIGITAL INPUT PLL
Q301
XN1212TW
SWITCHING
IC352
SRM20256LM10
S.RAM
IC501
YM3404B
DIGITAL FILTER
IC361
MN74HCU04S
INVERTER
IC360
CD74HC4046A
DIGITAL PLL
IC362
UPD74HC163G
BINARY COUNTER
Q311~313
2SC3315CTA
SWITCHING
Q314
XN1112TW
SWITCHING CONT.
Q315
XN1112TW
SWITCHING CONT.
Q351
XN1212TW
SWITCHING
Q351 (1/2)
Q351
XN1212TW
DIGITAL INPUT PLL
Q353
2SC1047DTA
DIGITAL INPUT PLL
X351 (16MHz)
X352 (22MHz)
X353 (24MHz)
X354 (28MHz)
CN26
HSW
IDPP
PCMCIF
IPF
FLGCK
FLGDT
SUBCIF
GND
TEST CONNECTOR (To FLAG COUNTER)
CN29
NPRDY
PCLK
PRXD
PTXD
NRST2
To M INTERFACE CIRCUIT (CN806) on page 63
CN41
RF GND
PB DT
RF GND
PBCK
RFENV
SRPR
SRRF
SRWND2
SRWND1
To N RF CIRCUIT (CN42) on page 57
CN43
PLLOFS
HFCH
VFPLFS
FCH
ENVT
R3CP
NSERVRST
HSW
MBUS0
MBUS1
MBUS2
MBUS3
MSTB
MRDY
D.GND
NPMUTE
To O SERVO CIRCUIT (CN44) on page 51
CN23
DIP4
DIP3
DIP2
DIP1
To B DIGITAL IN/OUT TERMINAL CIRCUIT (CN1004) on page 44
rec/play
T=30ms.
T=15ms.
T=0.22μs.
T=0.43μs.
T=0.18μs.
T=0.36μs.
T=11.4μs.
T=0.7μs.
T=23μs.
T=5.6μs.
f=10MHz
f=8MHz
1.536MHz
28MHz
0.1μs. 2V/DIV.
-5.2V

Note 2:

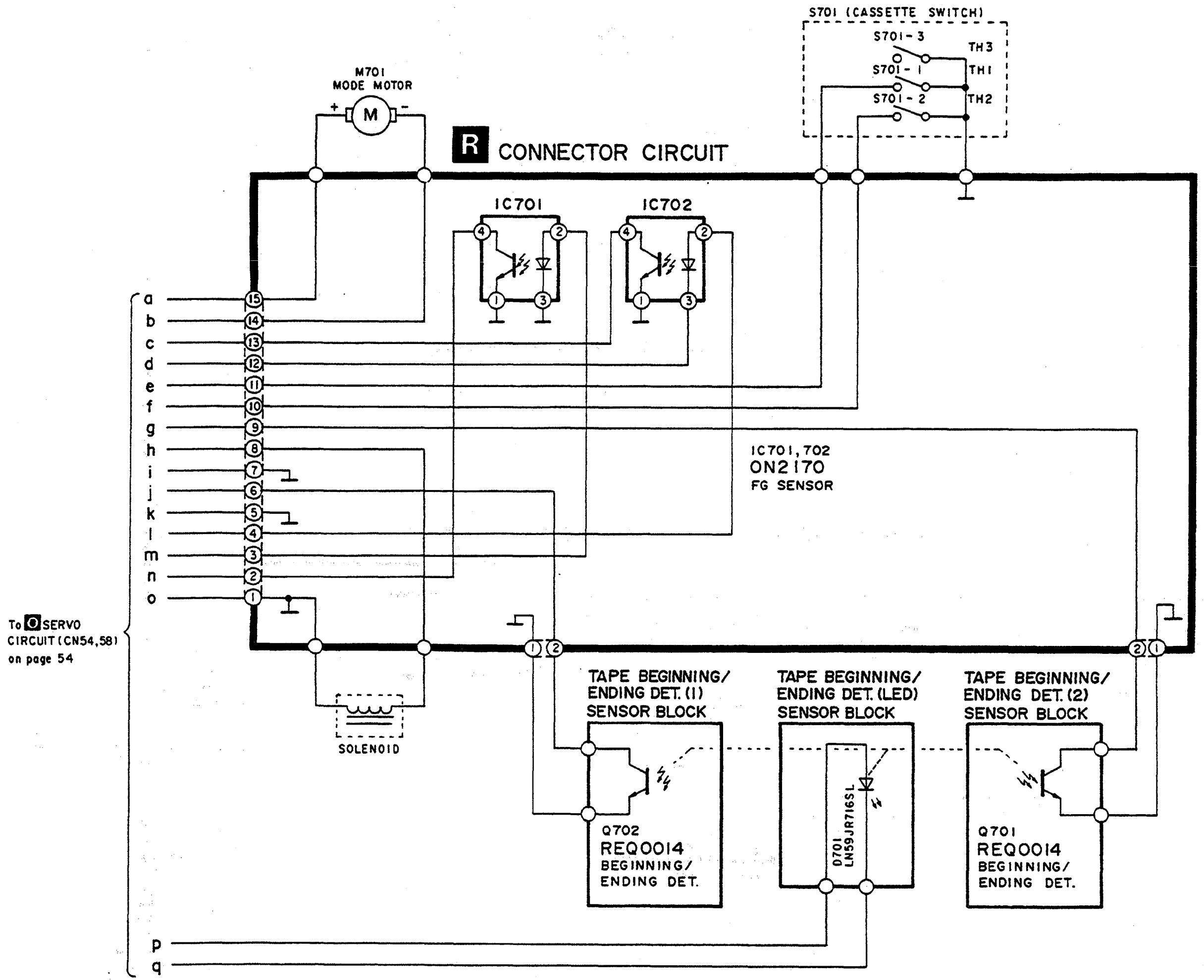
- **S701** : Tape hole detection switch.
- **S702** : Loading detection switch.
- **S703** : Mode detection switch.
- **S751** : Cassette tray open detection switch.
- **S752** : Cassette tray close detection switch.
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position otherwise specified.
  ( )………Voltage values at recording mode.
  For measurement us EVM.
- Important safety notice
  Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
- (━━━) indicates +B (bias).
- (━ ━ ━) indicates −B (bias).
- (⇢) indicates the flow of the playback signal.
- (⇨) indicates the flow of the recording signal.
- The "IC701, IC702, Q701, Q702, D701, MR701, L701~708, CAPH701~703, CYLH701~703" parts are not supplied separately and are thus not found on the replacement parts list.


O SERVO CIRCUIT
To G POWER SUPPLY CIRCUIT (CN9) on page 62.
CN10
M12
D5
M.GND
D.GND
To N RF CIRCUIT (CN45) on page 57.
CN45
D5
AGND
PILOT
SYNC
HSW
To I MAIN CIRCUIT (CN43) on page 49.
CN44
PLLOFS
HFCH
VFPLFS
FCH
ENVT
R3CP
NRST2
HSW
MBUS0
MBUS1
MBUS2
MBUS3
MSTB
MRDY
D GND
NP MUTE
11.8V
4.8V
IC201
MN6742SDR
SERVO PROCESSOR
R289 47K
X201 (8MHz)
C203 18P
C204 18P
rec/play
T=13ms.
T=0.75ms.
T=120ms.
T=1ms.
T=30ms.
R201 1K
C201 6.3V47
C202 0.1
IC207
UPD74HC04GE2
INVERTER
IC209
AN78L05ME2
REGULATOR
80k~100kHz
IC206
M5228FPE2
ANALOG SWITCH
Q276
D204 MA151ATW
C231 10V47
C273
R275
R277
R278
Q276
DTB113ZKTW
SWITCHING
IC208
Q277
R250 15K
C260 0.33
R251 100K
Q277
DTA114EKTW
SWITCHING
IC208
MN4066BS-T2
ANALOG SWITCH
R202 22
R286 10K
C275
C288
R248 8.2K
R208 68K
C209 MBO.1
R213 270K
T=30ms
T=120ms.
IC271
Q275
C280 0.33
Q275
DTC124EKTW
SWITCHING
X202 (8MHz)
R290 47K
L203 100μH
T=9ms.
33.33Hz
T=0.43μs.
T=15ms.
C205 0.1
IC202
R298 47K
T=2ms.
T=0.75ms.
IC275
C270 6.3V47
C271 0.1
IC275
TC4S81FTX
AND GATE
IC271
MN17541SDN2
MECHANISM CONTROL
T=13ms.
66.66Hz
IC202
MN53020SDQ
ATF
T=30ms.

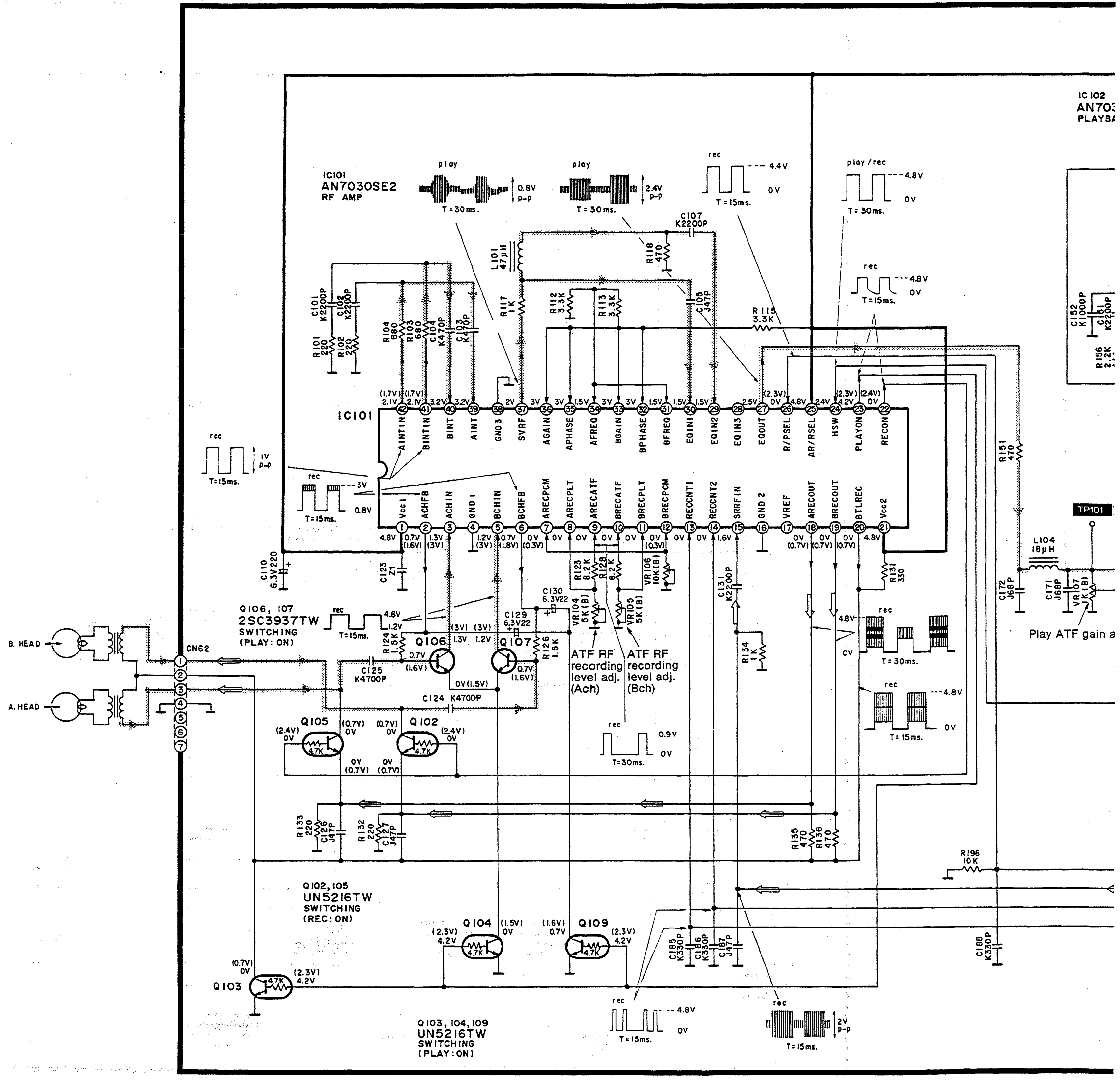

6
7
8
9
10
11
12
13
14
15
16
IC201
MN6742SDR
SERVO PROCESSOR
X201 (8MHz)
IC207
UPD74HC04GE2
INVERTER
IC209
AN78L05ME2
REGULATOR
IC206
M5228FPE2
ANALOG SWITCH
80k~400kHz
Q276
DTB113ZKTW
SWITCHING
Q277
DTA114EKTW
SWITCHING
IC208
MN4066BS-T2
ANALOG SWITCH
Q201
2SB956RTW
VOLTAGE CONTROL
IC273
AN1339SE2
VOLTAGE CONT.
BEGINNING/ENDING DET & DEW SENSOR DET.
IC204
IC205
IC272
AN6607NSE2
MODE MOTOR DRIVE
IC271
MN17541SDN2
MECHANISM CONTROL
IC202
MN53020SDQ
ATF
IC203
AN8320NFA
LINEAR SERVO
P.G. phase adj.
Q271
2SD1280STW
SWITCHING
IC274
TA7291S
TRAY MOTOR CONTROL
Tape begin/end det. sensitivity adj.
Q274
2SB709RTW
BEGINNING/ENDING DET.
rec/play
play
T=13ms.
T=0.75ms.
T=120ms.
T=1ms.
T=30ms.
T=9ms.
T=15ms.
33.33Hz
T=0.43μs.
66.66Hz
T=2ms.
T=1.75ms.
T=30ms.
11.8V
4.8V


12
13
14
15
16
17
18
19
20
21
Q201
2SB956RTW
VOLTAGE CONTROL
IC273
AN1339SE2
VOLTAGE CONT.
BEGINNING/ENDING DET & DEW SENSOR DET.
IC204
AN3841SR
CAPSTAN MOTOR DRIVE
IC205
AN3841SR
CYLINDER MOTOR DRIVE
IC272
AN6607NSE2
MODE MOTOR DRIVE
IC203
AN8320NFA
LINEAR SERVO
Q271
2SD1280STW
SWITCHING
IC274
TA7291S
TRAY MOTOR CONTROL
Q272
DTA123JKTW
SWITCHING
Q274
2SB709RTW
BEGINNING/ENDING DET.
Tape begin/end det. sensitivity adj.
rec/play
T=2ms.
T=1.75ms.
CAPSTAN MOTOR BLOCK
MR701
CAPH701
CAPH702
CAPH703
L701
L702
L703
SYLINDER MOTOR BLOCK
CYLH701
CYLH702
CYLH703
L704
L705
L706
L707
L708
CN51
CN52
CN53
CN54
CN56
CN57
CN58
LOADE SWITCH BLOCK
S702-1 LOADE
S702-2 LOADE
MODE SWITCH BLOCK
S703-1 MODE1
S703-2 MODE2
S703-3 MODE3
To R CONNECTOR CIRCUIT on page 55.
P TRAY MOTOR CIRCUIT
M751 TRAY MOTOR
C751 0.01
CN71
CN70
DEW SENSOR BLOCK
CN72
S751 (OPEN)
S752 (CLOSE)
Q SWITCH CIRCUIT

R CONNECTOR CIRCUIT

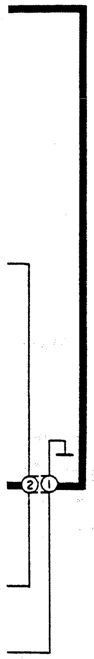

S701 (CASSETTE SWITCH)
S701-3
S701-1
S701-2
TH3
TH1
TH2
M701
MODE MOTOR
M
IC701
IC702
IC701, 702
ON2170
FG SENSOR
a
b
c
d
e
f
g
h
i
j
k
l
m
n
o
p
q
To O SERVO CIRCUIT (CN54,58) on page 54
SOLENOID
TAPE BEGINNING/ ENDING DET. (1) SENSOR BLOCK
TAPE BEGINNING/ ENDING DET. (LED) SENSOR BLOCK
TAPE BEGINNING/ ENDING DET. (2) SENSOR BLOCK
Q702
REQ0014
BEGINNING/ ENDING DET.
D701
LN59JR716SL
Q701
REQ0014
BEGINNING/ ENDING DET.

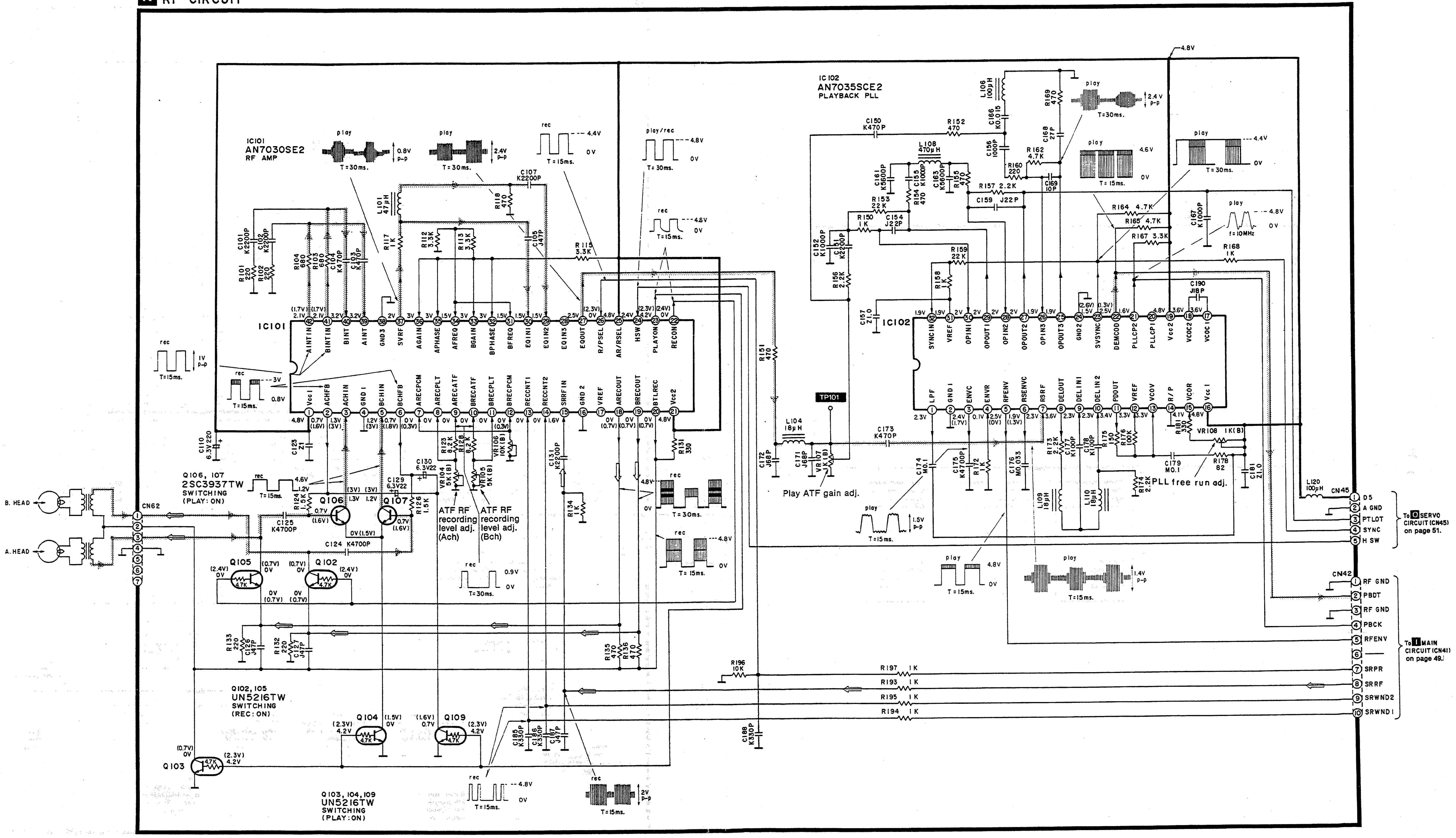
N RF CIRCUIT


IC101
AN7030SE2
RF AMP
IC102
AN703
PLAYB
play
0.8V p-p
T=30ms.
play
2.4V p-p
T=30ms.
rec
4.4V
0V
T=15ms.
play/rec
4.8V
0V
T=30ms.
rec
4.8V
0V
T=15ms.
C107 K2200P
L101 47μH
R117 1K
R118 470
R112 3.3K
R113 3.3K
C105 J47P
R115 3.3K
C101 K2200P
C102 K2200P
R101 220
R102 220
R104 680
R103 680
C104 K4700P
C103 K10P
C152 K1000P
C151 K220P
R156 2.2K
IC101
AINTIN
BINTIN
BINT
AINT
GND3
SVRF
AGAIN
APHASE
AFREQ
BGAIN
BPHASE
BFREQ
EQIN1
EQIN2
EQIN3
EQOUT
R/PSEL
AR/RSEL
HSW
PLAYON
RECON
Vcc1
ACHFB
ACHIN
GND1
BCHIN
BCHFB
ARECPCM
ARECPLT
ARECATF
BRECATF
BRECPLT
BRECPCM
RECCNT1
RECCNT2
SRRF IN
GND2
VREF
ARECOUT
BRECOUT
BTLREC
Vcc2
rec
1V p-p
T=15ms.
rec
3V
0.8V
T=15ms.
C110 6.3V220
C123 Z1
R123 8.2K
R128 8.2K
VR106 10K(B)
C131 K2200P
R131 330
R151 470
TP101
L104 18μH
C172 J68P
C171 J68P
VR107 1K(B)
Play ATF gain a
B. HEAD
A. HEAD
CN62
Q106, 107
2SC3937TW
SWITCHING
(PLAY: ON)
rec
4.6V
T=15ms.
R124 1.5K
Q106
Q107
R126 1.5K
C130 6.3V22
C129 6.3V22
VR104 5K(B)
VR105 5K(B)
C125 K4700P
C124 K4700P
ATF RF recording level adj. (Ach)
ATF RF recording level adj. (Bch)
R134 1K
rec
0.9V
0V
T=30ms.
rec
T=30ms.
rec
4.8V
0V
T=15ms.
Q105
Q102
4.7K
R133 220
C126 J47P
R132 220
C127 J47P
R135 470
R136 470
R196 10K
C188 K330P
Q102, 105
UN5216TW
SWITCHING
(REC: ON)
Q104
Q109
Q103
C185 K330P
C186 K330P
C187 J47P
Q103, 104, 109
UN5216TW
SWITCHING
(PLAY: ON)
rec
4.8V
0V
T=15ms.
rec
2V p-p
T=15ms.

27 28 29 30 31 32 33 34 35 36

N RF CIRCUIT

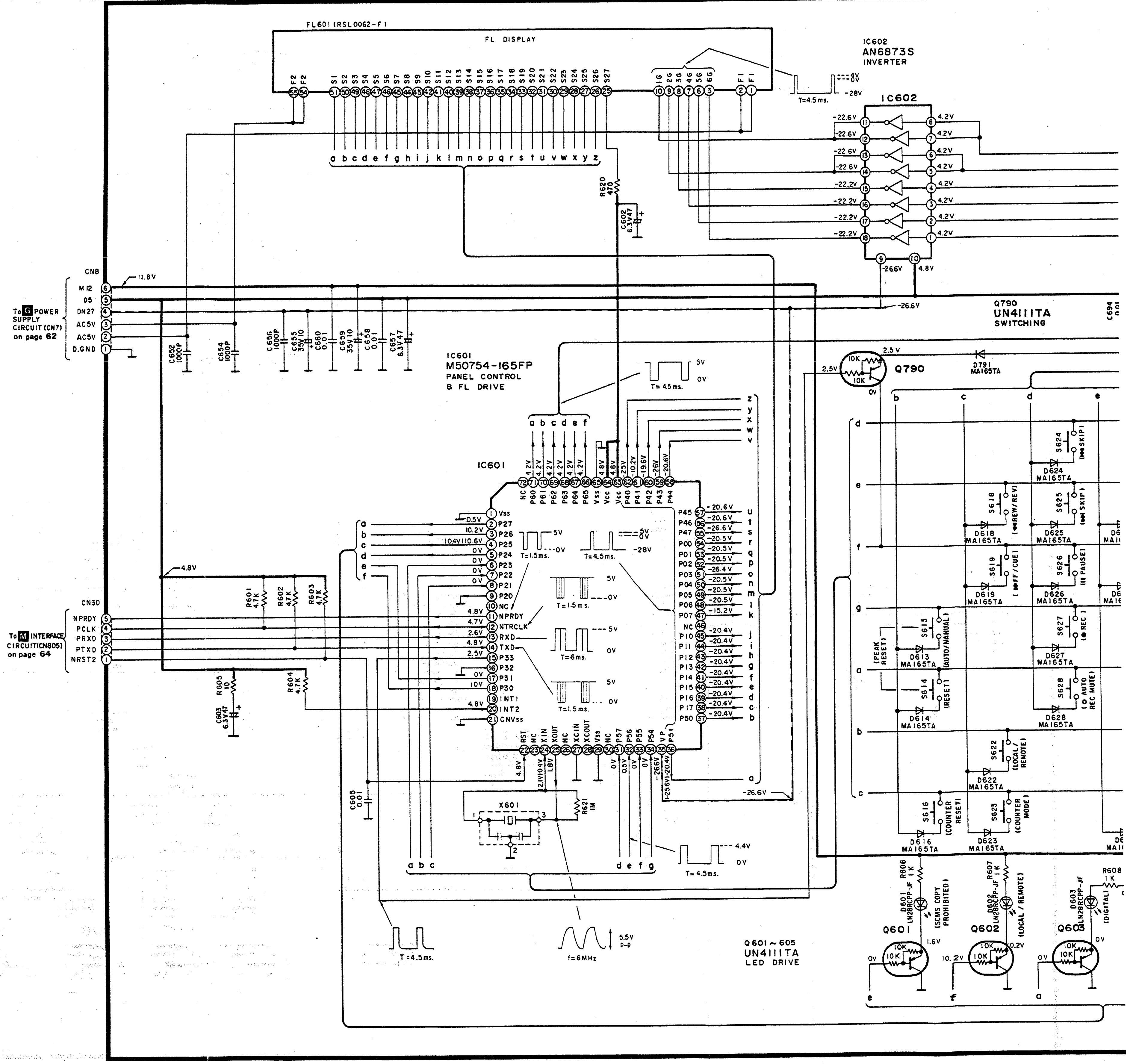



IC101
AN7030SE2
RF AMP
IC102
AN7035SCE2
PLAYBACK PLL
Q106, 107
2SC3937TW
SWITCHING
(PLAY: ON)
Q102, 105
UN5216TW
SWITCHING
(REC: ON)
Q103, 104, 109
UN5216TW
SWITCHING
(PLAY: ON)
B. HEAD
A. HEAD
CN62
TP101
Play ATF gain adj.
ATF RF recording level adj. (Ach)
ATF RF recording level adj. (Bch)
PLL free run adj.
CN45
D5
A GND
PTLOT
SYNC
H SW
To Q SERVO CIRCUIT (CN45) on page 51.
CN42
RF GND
PBDT
RF GND
PBCK
RFENV
SRPR
SRRF
SRWND2
SRWND1
To I MAIN CIRCUIT (CN41) on page 49.
T=30ms.
T=15ms.
f=10MHz
play
rec
play/rec
4.8V

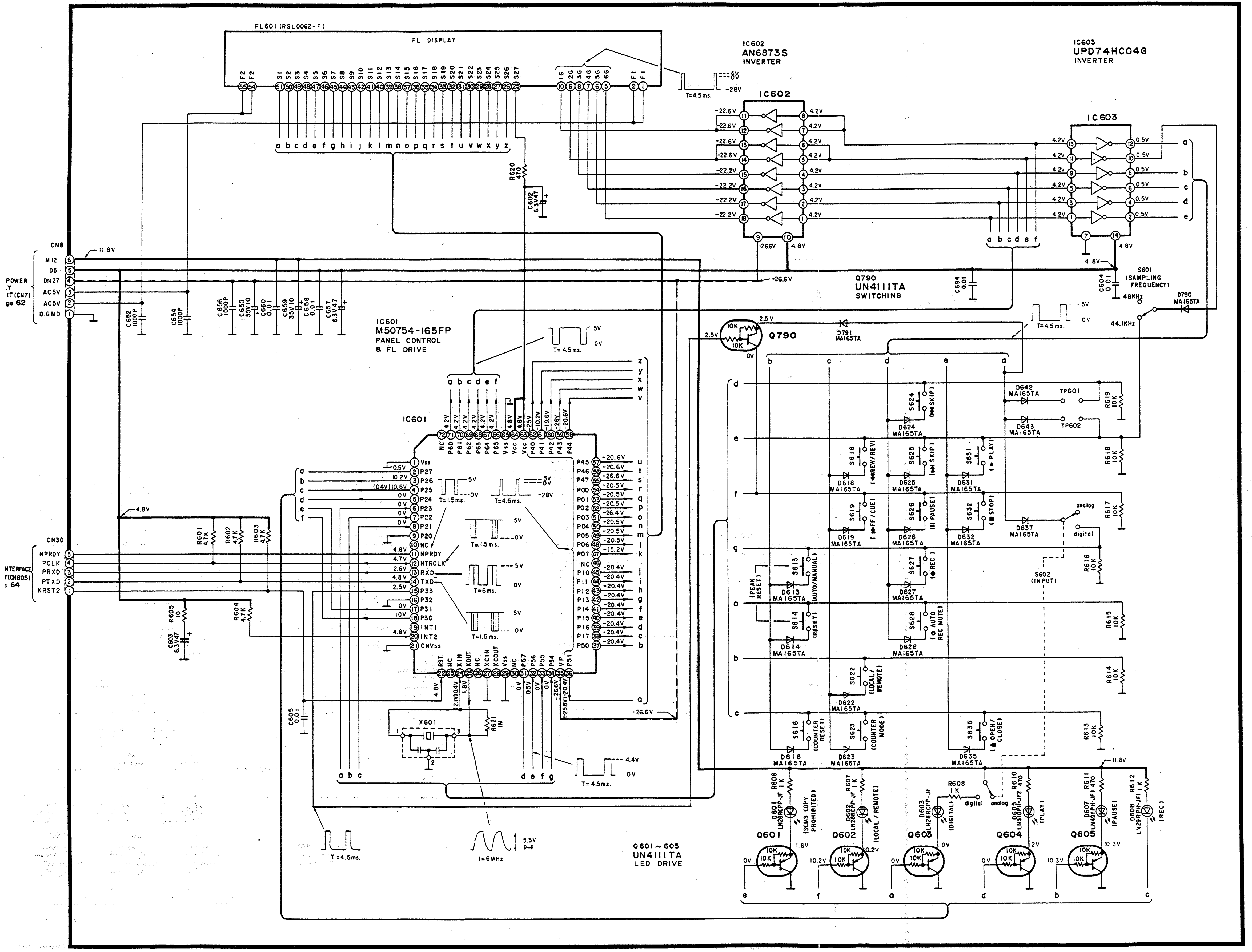
Note 3:

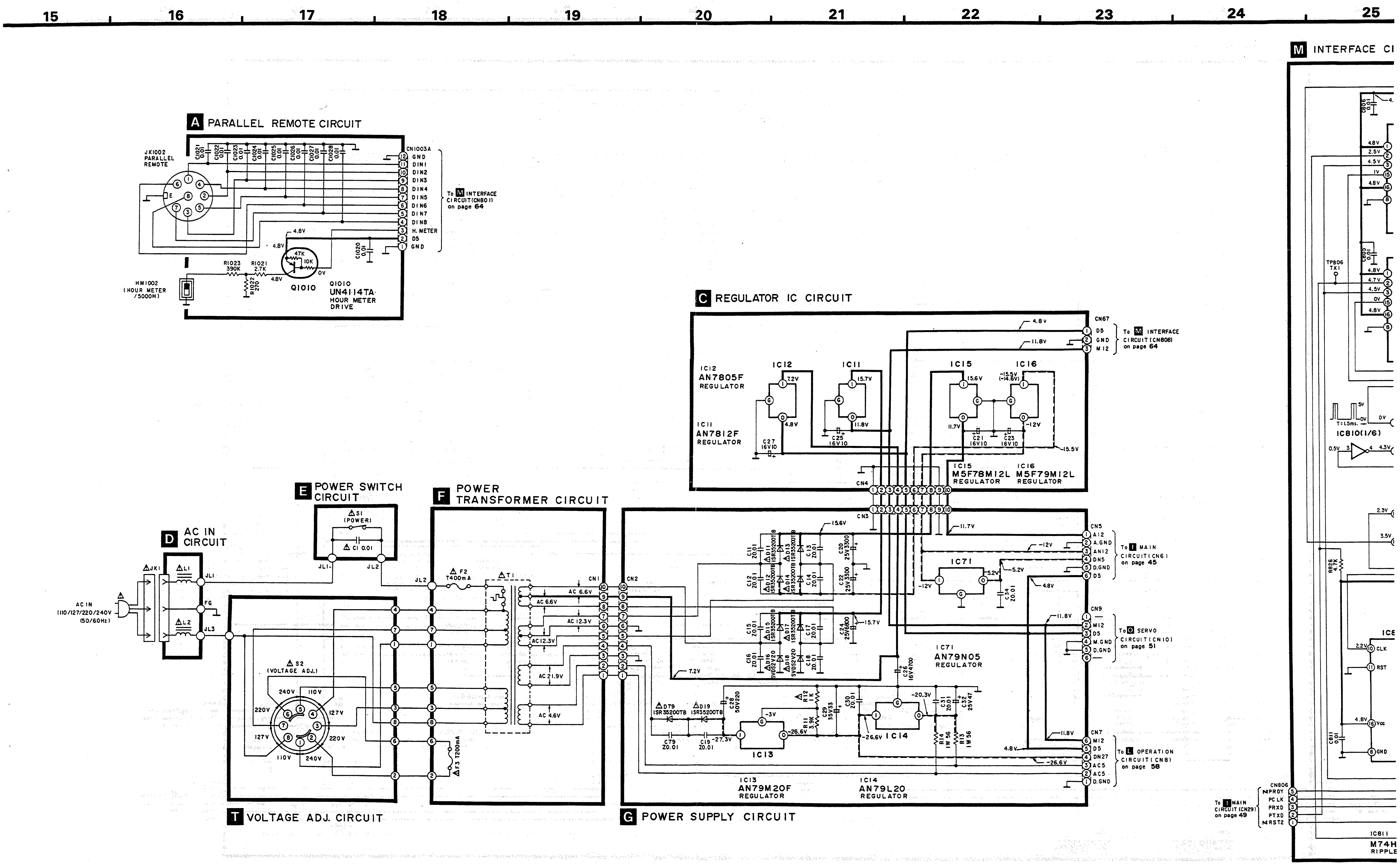
- **S1** : Power switch (POWER).
- **S2** : Voltage adj. switch.
- **S601** : Sampling frequency selector switch. (SAMPLING FREQUENCY) (44.1kHz ↔ 48kHz).
- **S602** : Input selector switch (INPUT) (▬ DIGITAL/ ■ ANALOG).
- **S613, 614** : Peak reset switches (PEAK RESET). [S613: AUTO/MANUAL, S614: RESET]
- **S616** : Counter reset switch (COUNTER RESET).
- **S618** : Rew/rev switch (REW/REV).
- **S619** : FF/cue switch (FF/CUE).
- **S622** : Local/remote switch (LOCAL/REMOTE).
- **S623** : Counter mode switch (COUNTER MODE).
- **S624, 625** : Skip switches (SKIP). [S624 ⏮, S625 ⏭]
- **S626** : Pause switch (PAUSE).
- **S627** : Record switch (REC).
- **S628** : Auto rec mute switch (AUTO REC MUTE).
- **S631** : Play switch (PLAY).
- **S632** : Stop switch (STOP).
- **S635** : Open/close switch (OPEN/CLOSE).
- **S801, 802** : DIP switches.
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position otherwise specified.
  ( )......... Voltage values at recording mode.
  For measurement us EVM.
- Important safety notice
  Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
- (▬▬) indicates +B (bias).
- (▬ ▬ ▬) indicates −B (bias).
- (⇢) indicates the flow of the playback signal.
- (⇨) indicates the flow of the recording signal.

L OPERATION CIRCUIT

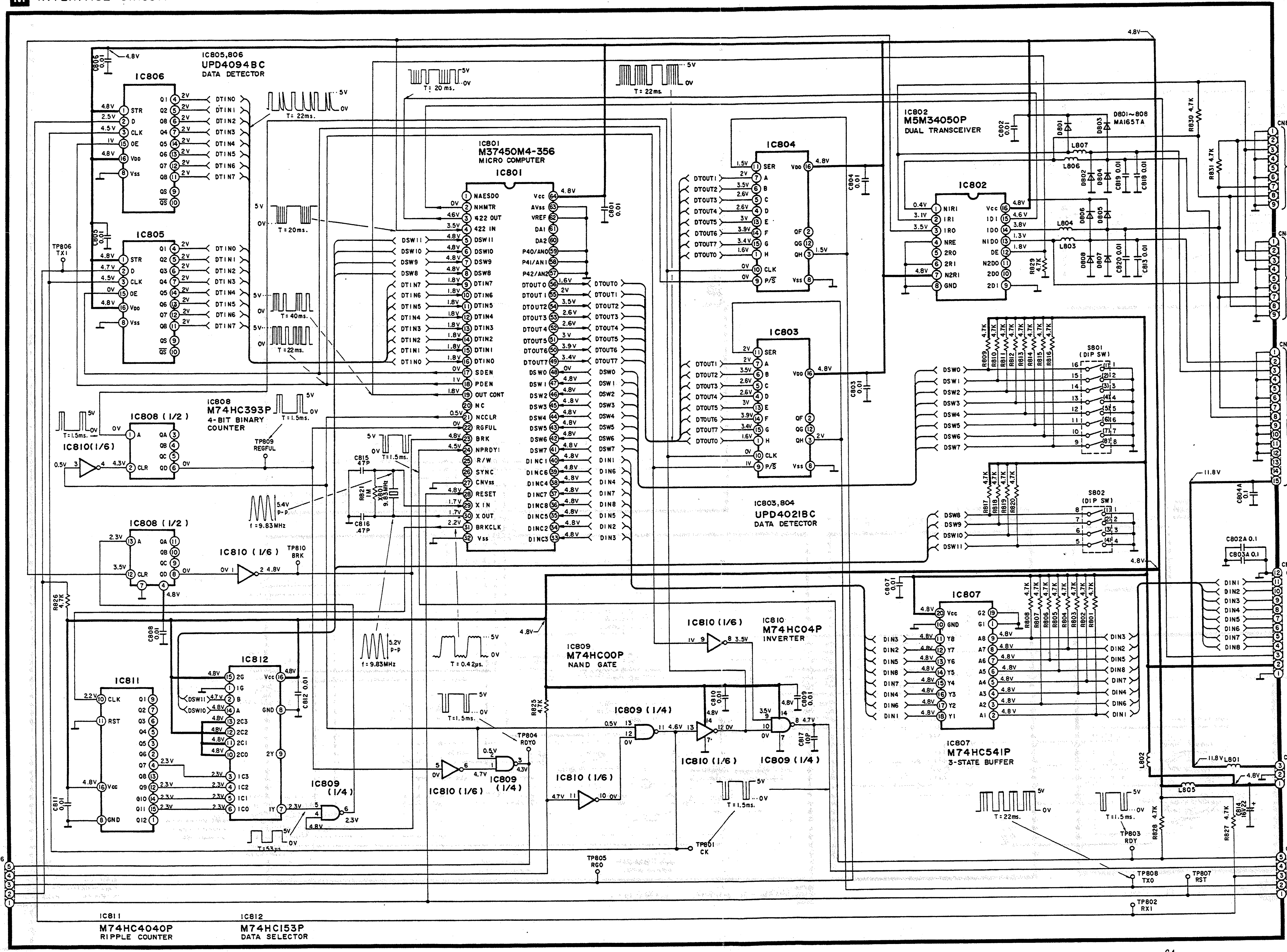

FL601 (RSL0062-F)
FL DISPLAY
IC602
AN6873S
INVERTER
T=4.5ms.
-28V
CN8
To G POWER SUPPLY CIRCUIT (CN7) on page 62
M12
D5
DN27
AC5V
AC5V
D.GND
11.8V
C652 1000P
C654 1000P
C656 1000P
C655 35V10
C660 0.01
C659 35V10
C658 0.01
C657 6.3V47
R620 470
C602 6.3V47
IC601
M50754-165FP
PANEL CONTROL & FL DRIVE
Q790
UN4111TA
SWITCHING
D791 MA165TA
CN30
To M INTERFACE CIRCUIT (CN805) on page 64
NPRDY
PCLK
PRXD
PTXD
NRST2
4.8V
R601 4.7K
R602 4.7K
R603 4.7K
R604 4.7K
R605 10
C603 6.3V47
C605 0.01
X601
R621 1M
f=6MHz
5.5V p-p
S624 (⏮ SKIP)
S625 (⏭ SKIP)
S618 (◀◀ REW/REV)
S619 (▶▶ FF/CUE)
S626 (II PAUSE)
S627 (● REC)
S628 (○ AUTO REC MUTE)
S613 (AUTO/MANUAL)
S614 (RESET)
(PEAK RESET)
S622 (LOCAL/REMOTE)
S616 (COUNTER RESET)
S623 (COUNTER MODE)
D624 MA165TA
D625 MA165TA
D618 MA165TA
D619 MA165TA
D626 MA165TA
D627 MA165TA
D613 MA165TA
D614 MA165TA
D628 MA165TA
D622 MA165TA
D616 MA165TA
D623 MA165TA
R606 1K
R607 1K
R608 1K
D601 LN28RCPP-JF (SCMS COPY PROHIBITED)
D602 LN28RCPP-JF (LOCAL / REMOTE)
D603 LN28RCPP-JF (DIGITAL)
Q601
Q602
Q603
Q601 ~ 605
UN4111TA
LED DRIVE

L OPERATION CIRCUIT

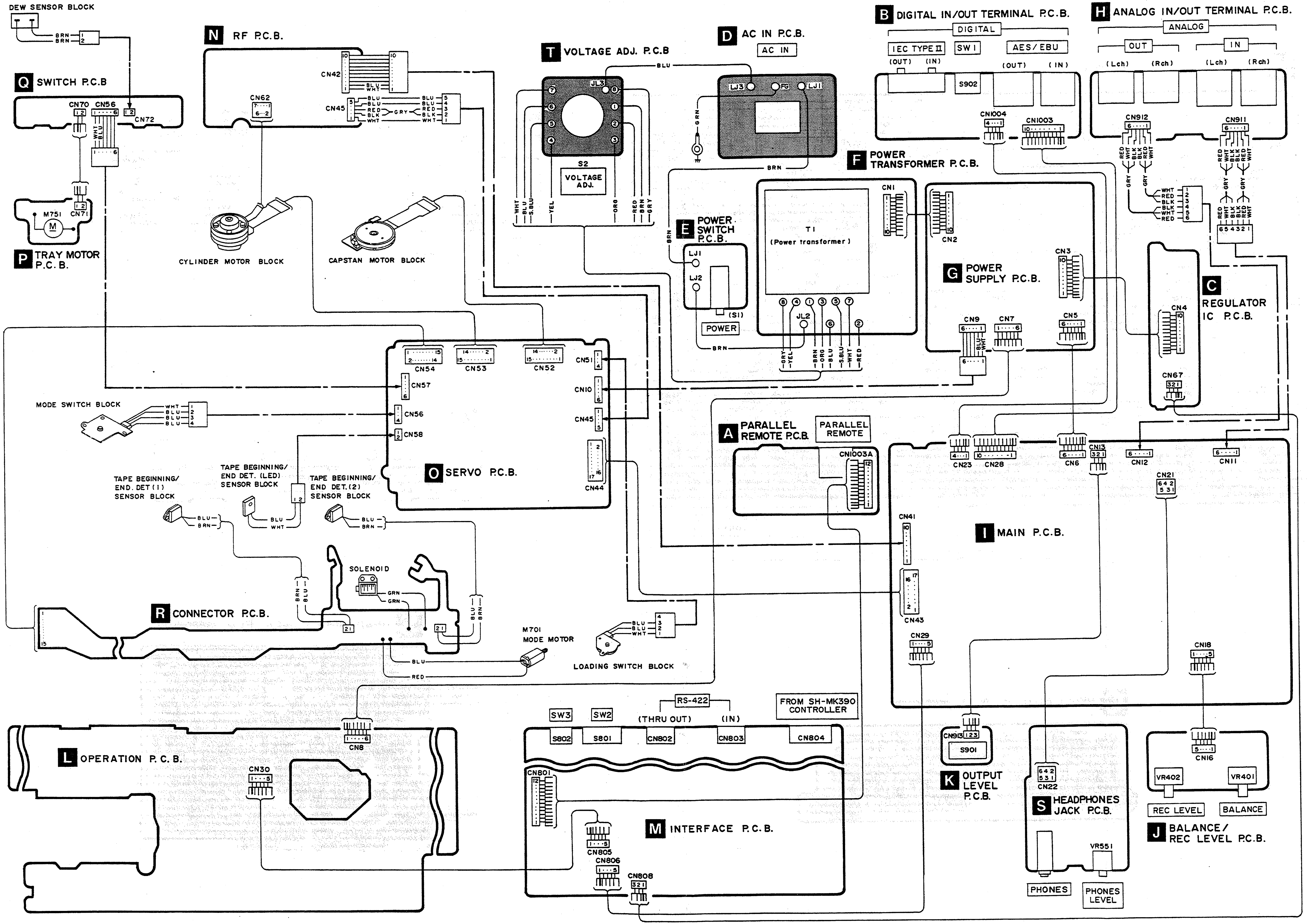

FL601 (RSL0062-F)
FL DISPLAY
F2 F2 S1 S2 S3 S4 S5 S6 S7 S8 S9 S10 S11 S12 S13 S14 S15 S16 S17 S18 S19 S20 S21 S22 S23 S24 S25 S26 S27 1G 2G 3G 4G 5G 6G F1 F1
a b c d e f g h i j k l m n o p q r s t u v w x y z
T=4.5ms.
4V
0V
-28V
IC602
AN6873S
INVERTER
IC603
UPD74HC04G
INVERTER
IC602
IC603
-22.6V
-22.2V
4.2V
0.5V
-26.6V
4.8V
R620 470
C602 6.3V47
CN8
M12
D5
DN27
AC5V
AC5V
D.GND
11.8V
POWER
C682 1000P
C654 1000P
C656 1000P
C653 35V10
C660 0.01
C659 35V10
C658 0.01
C657 6.3V47
Q790
UN4111TA
SWITCHING
C694 0.01
C604 0.01
S601 (SAMPLING FREQUENCY)
48KHz
44.1KHz
D790 MA165TA
D791 MA165TA
2.5V
10K
IC601
M50754-165FP
PANEL CONTROL & FL DRIVE
5V
0V
T=4.5ms.
IC601
Vss P27 P26 P25 P24 P23 P22 P21 P20 NC NPRDY NTRCLK RXD TXD P33 P32 P31 P30 INT1 INT2 CNVss
NC P60 P61 P62 P63 P64 P65 Vss Vcc P40 P41 P42 P43 P44
P45 P46 P47 P00 P01 P02 P03 P04 P05 P06 P07 NC P10 P11 P12 P13 P14 P15 P16 P17 P50
RST NC XIN XOUT NC XCIN XCOUT Vss NC P57 P56 P55 P54 VP P51
T=1.5ms.
T=6ms.
CN30
NPRDY
PCLK
PRXD
PTXD
NRST2
INTERFACE
R601 4.7K
R602 4.7K
R603 4.7K
R605 10
C603 6.3V47
R604 4.7K
C605 0.01
X601
R621 1M
T=4.5ms.
4.4V
f=6MHz
5.5V P-P
S624 (SKIP)
S618 (REW/REV)
S625 (SKIP)
S631 (PLAY)
S619 (FF/CUE)
S626 (PAUSE)
S632 (STOP)
S613 (AUTO/MANUAL) (PEAK RESET)
S627 (REC)
S614 (RESET)
S628 (AUTO REC MUTE)
S622 (LOCAL/REMOTE)
S616 (COUNTER RESET)
S623 (COUNTER MODE)
S635 (OPEN/CLOSE)
S602 (INPUT)
analog
digital
D642 MA165TA
D643 MA165TA
TP601
TP602
D637 MA165TA
D613 D614 D616 D618 D619 D622 D623 D624 D625 D626 D627 D628 D631 D632 D635 MA165TA
R619 10K
R618 10K
R617 10K
R616 10K
R615 10K
R614 10K
R613 10K
R606 1K
R607 1K
R608 1K
R610 470
R611 470
R612 1K
D601 LN28RCPP-JF (SCMS COPY PROHIBITED)
D602 LN28RCPP-JF (LOCAL / REMOTE)
D603 LN28RCPP-JF (DIGITAL)
D605 LN31GPH-JF2 (PLAY)
D607 LN49YPH-JF1 (PAUSE)
D608 LN28RCPP-JF1 (REC)
Q601 Q602 Q603 Q604 Q605
Q601 ~ 605
UN4111TA
LED DRIVE


15
16
17
18
19
20
21
22
23
24
25
A PARALLEL REMOTE CIRCUIT
JK1002 PARALLEL REMOTE
C1021 0.01
C1022 0.01
C1023 0.01
C1024 0.01
C1025 0.01
C1026 0.01
C1027 0.01
C1028 0.01
CN1003A
GND
DIN1
DIN2
DIN3
DIN4
DIN5
DIN6
DIN7
DIN8
H. METER
D5
GND
To M INTERFACE CIRCUIT(CN801) on page 64
4.8V
47K
10K
0V
C1020 0.01
R1023 390K
R1021 2.7K
R1022 270
HM1002 (HOUR METER /5000H)
Q1010
Q1010 UN4114TA HOUR METER DRIVE
C REGULATOR IC CIRCUIT
IC12 AN7805F REGULATOR
IC11 AN7812F REGULATOR
IC12
IC11
IC15
IC16
7.2V
15.7V
15.6V
-15.5V (-14.8V)
4.8V
11.8V
11.7V
-12V
-15.5V
C27 16V10
C25 16V10
C21 16V10
C23 16V10
IC15 M5F78M12L REGULATOR
IC16 M5F79M12L REGULATOR
CN67
D5
GND
M12
To M INTERFACE CIRCUIT(CN808) on page 64
CN4
CN3
E POWER SWITCH CIRCUIT
S1 (POWER)
C1 0.01
JL1
JL2
F POWER TRANSFORMER CIRCUIT
F2 T400mA
T1
CN1
AC 6.6V
AC 12.3V
AC 21.9V
AC 4.6V
F3 T200mA
D AC IN CIRCUIT
JK1
L1
L2
JL1
FG
JL3
AC IN (110/127/220/240V) (50/60Hz)
T VOLTAGE ADJ. CIRCUIT
S2 (VOLTAGE ADJ.)
240V
110V
220V
127V
G POWER SUPPLY CIRCUIT
CN2
15.6V
11.7V
C11 Z0.01
C12 Z0.01
D11 ISR35200TB
D12 ISR35200TB
D13 ISR35200TB
D14 ISR35200TB
C13 Z0.01
C14 Z0.01
C20 25V3300
C22 25V3300
C15 Z0.01
C16 Z0.01
D15 ISR35200TB
D16 SV0S2V20
D17 ISR35200TB
D18 SV0S2V20
C17 Z0.01
C18 Z0.01
C24 25V6800
15.7V
7.2V
IC71
-12V
5.2V
C34 Z0.01
IC71 AN79N05 REGULATOR
C26 16V4700
D79 ISR35200TB
D19 ISR35200TB
C79 Z0.01
C19 Z0.01
C28 50V220
-27.3V
-3V
-26.6V
R12 1K
R11 3.9K
C29 35V33
C30 Z0.01
-20.3V
C31 Z0.01
C32 25V47
R14 1W 56
R13 1W 56
IC13
IC14
IC13 AN79M20F REGULATOR
IC14 AN79L20 REGULATOR
CN5
A12
A.GND
AN12
DN5
D.GND
D5
To I MAIN CIRCUIT(CN6) on page 45
CN9
M12
D5
M.GND
D.GND
To O SERVO CIRCUIT(CN10) on page 51
CN7
M12
D5
DN27
ACS
ACS
D.GND
To L OPERATION CIRCUIT(CN8) on page 58
11.8V
4.8V
-26.6V
M INTERFACE CI
C806
4.8V
2.5V
4.5V
1V
4.8V
C805
TP806 TX1
4.8V
4.7V
4.5V
0V
4.8V
5V
0V
T=1.5ms.
IC810(1/6)
0.5V
4.3V
2.3V
3.5V
R826 4.7K
IC8
2.2V
CLK
RST
4.8V
Vcc
C811 0.01
GND
CN806
PRDY
PCLK
PRXD
PTXD
RST2
To I MAIN CIRCUIT (CN29) on page 49
IC811
M74H
RIPPLE

M INTERFACE CIRCUIT


IC805,806
UPD4094BC
DATA DETECTOR
IC806
IC805
STR
D
CLK
OE
VDD
Vss
DTIN0
DTIN1
DTIN2
DTIN3
DTIN4
DTIN5
DTIN6
DTIN7
T= 22ms.
T=20ms.
T= 40ms.
T=22ms.
TP806
TX1
IC801
M37450M4-356
MICRO COMPUTER
NAESDO
NHMTR
422 OUT
422 IN
DSW11
DSW10
DSW9
DSW8
SDEN
PDEN
OUT CONT
NC
NCCLR
RGFUL
BRK
NPRDY1
R/W
SYNC
CNVss
RESET
X IN
X OUT
BRKCLK
Vss
Vcc
AVss
VREF
DA1
DA2
P40/AN0
P41/AN1
P42/AN2
DTOUT0
DTOUT1
DTOUT2
DTOUT3
DTOUT4
DTOUT5
DTOUT6
DTOUT7
DSW0
DSW1
DSW2
DSW3
DSW4
DSW5
DSW6
DSW7
DINC1
DINC6
DINC4
DINC7
DINC8
DINC5
DINC2
DINC3
DIN1
DIN6
DIN4
DIN7
DIN8
DIN5
DIN2
DIN3
C801 0.01
T: 20 ms.
T= 22ms.
IC808
M74HC393P
4-BIT BINARY
COUNTER
IC808 (1/2)
IC810(1/6)
T=1.5ms.
TP809
REGFUL
C815 47P
C816 47P
R821 1M
X801 9.83MHz
f = 9.83MHz
5.4V p-p
IC808 (1/2)
IC810 (1/6)
TP810
BRK
R826 4.7K
C808 0.01
IC812
IC811
CLK
RST
Vcc
GND
DSW11
DSW10
2G
1G
B
A
2C3
2C2
2C1
2C0
1C3
1C2
1C1
1C0
2Y
1Y
C812 0.01
C811 0.01
5.2V p-p
f = 9.83MHz
T = 0.42μs.
T=1.5ms.
TP804
RDY0
IC810 (1/6)
IC809 (1/4)
IC809 (1/4)
T=53μs.
IC809
M74HC00P
NAND GATE
R825 4.7K
IC809 (1/4)
IC810 (1/6)
IC810 (1/6)
IC810
M74HC04P
INVERTER
IC810 (1/6)
IC809 (1/4)
C810 0.01
C809 0.01
C817 10P
T=1.5ms.
TP801
CK
TP805
RG0
IC804
IC803
SER
VDD
QF
QG
QH
CLK
P/S
Vss
C804 0.01
C803 0.01
IC803,804
UPD4021BC
DATA DETECTOR
IC802
M5M34050P
DUAL TRANSCEIVER
C802 0.01
N1R1
1R1
1R0
NRE
2R0
2R1
N2R1
GND
Vcc
1D1
1D0
N1D0
DE
N2D0
2D0
2D1
D801~808
MA165TA
L807
L806
L804
L803
C819 0.01
C818 0.01
C820 0.01
C813 0.01
R829 4.7K
R830 4.7K
R831 4.7K
CN802
THRU OUT
RS-422
CN803
IN
ALTERNATIVE
CN804
FROM SH-MK390
CONTROLLER
S801
(DIP SW)
R809 4.7K
R810
R811
R812
R813
R814
R815
R816
S802
(DIP SW)
R817
R818
R819
R820
C804A 0.1
C802A 0.1
C803A 0.1
CN801
GND
DIN1
DIN2
DIN3
DIN4
DIN5
DIN6
DIN7
DIN8
H. METER
D5
To A PARALLEL REMOTE CIRCUIT (CN1003A) on page 61
IC807
G2
G1
A8
A7
A6
A5
A4
A3
A2
A1
Y8
Y7
Y6
Y5
Y4
Y3
Y2
Y1
C807 0.01
R808
R807
R806
R805
R804
R803
R802
R801
IC807
M74HC541P
3-STATE BUFFER
T=22ms.
T=1.5ms.
TP803
RDY
L802
L801
L805
R828 4.7K
R827 4.7K
R814 10K
C822
CN808
MI2
GND
D5
To C REGULATOR IC CIRCUIT (CN67) on page 62
CN805
NPRDY
PCLK
PRXD
PTXD
NRST2
To L OPERATION CIRCUIT (CN30) on page 58
TP808
TX0
TP807
RST
TP802
RX1
CN806
NPRDY
PCLK
PRXD
PTXD
NRST2
To I MAIN CIRCUIT (CN29) on page 49
IC811
M74HC4040P
RIPPLE COUNTER
IC812
M74HC153P
DATA SELECTOR

■ WIRING CONNECTION DIAGRAM

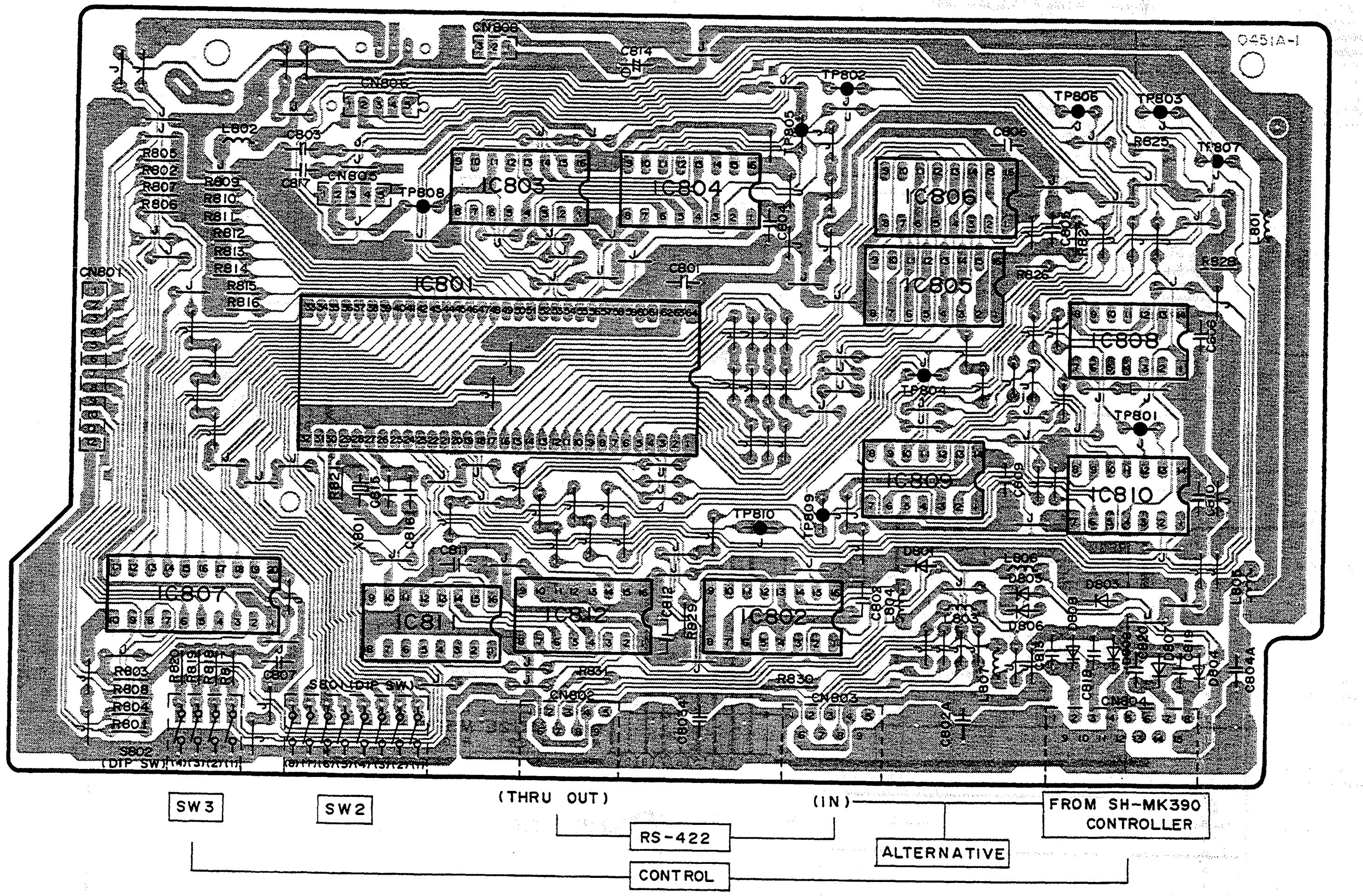

DEW SENSOR BLOCK
BRN
BRN
Q SWITCH P.C.B.
CN70
CN56
CN72
M751
CN71
P TRAY MOTOR P.C.B.
N RF P.C.B.
CN42
CN62
CN45
BLU
WHT
RED
BLK
GRY
CYLINDER MOTOR BLOCK
CAPSTAN MOTOR BLOCK
T VOLTAGE ADJ. P.C.B
S2
VOLTAGE ADJ.
JL3
S.BLU
YEL
ORG
BRN
D AC IN P.C.B.
AC IN
LJ3
FG
LJ1
GRN
B DIGITAL IN/OUT TERMINAL P.C.B.
DIGITAL
IEC TYPE II
(OUT)
(IN)
SW1
AES/EBU
S902
CN1004
CN1003
H ANALOG IN/OUT TERMINAL P.C.B.
ANALOG
OUT
IN
(Lch)
(Rch)
CN912
CN911
F POWER TRANSFORMER P.C.B.
CN1
T1
(Power transformer)
JL2
E POWER SWITCH P.C.B.
LJ1
LJ2
(S1)
POWER
CN2
CN3
G POWER SUPPLY P.C.B.
CN9
CN7
CN5
C REGULATOR IC P.C.B.
CN4
CN67
CN54
CN53
CN52
CN51
CN57
CN10
CN56
CN58
CN45
CN44
MODE SWITCH BLOCK
O SERVO P.C.B.
TAPE BEGINNING/ END. DET (1) SENSOR BLOCK
TAPE BEGINNING/ END DET. (LED) SENSOR BLOCK
TAPE BEGINNING/ END DET. (2) SENSOR BLOCK
SOLENOID
R CONNECTOR P.C.B.
M701 MODE MOTOR
LOADING SWITCH BLOCK
A PARALLEL REMOTE P.C.B.
PARALLEL REMOTE
CN1003A
CN23
CN28
CN6
CN13
CN12
CN11
CN21
CN41
I MAIN P.C.B.
CN43
CN29
CN18
L OPERATION P. C. B.
CN8
CN30
SW3
SW2
RS-422
(THRU OUT)
(IN)
FROM SH-MK390 CONTROLLER
S802
S801
CN802
CN803
CN804
CN801
M INTERFACE P.C.B.
CN805
CN806
CN808
CN913
S901
K OUTPUT LEVEL P.C.B.
CN22
S HEADPHONES JACK P.C.B.
VR551
PHONES
PHONES LEVEL
CN16
VR402
VR401
REC LEVEL
BALANCE
J BALANCE/ REC LEVEL P.C.B.

1 2 3 4 5 6 7 8 9

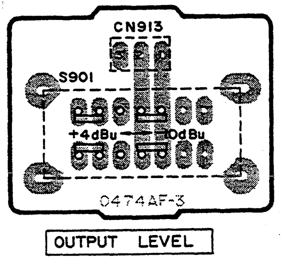
A B C D E F G

■PRINTED CIRCUIT BOARDS

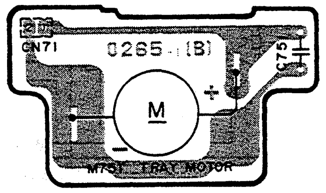
M INTERFACE P.C.B. (REP0737A)


0451A-1
CN808
CN806
CN805
CN801
CN802
CN803
CN804
IC801
IC802
IC803
IC804
IC805
IC806
IC807
IC808
IC809
IC810
IC811
IC812
TP801
TP802
TP803
TP804
TP805
TP806
TP807
TP808
TP809
TP810
L801
L802
S801 (DIP SW)
S802 (DIP SW)
SW3
SW2
(THRU OUT)
(IN)
RS-422
CONTROL
ALTERNATIVE
FROM SH-MK390 CONTROLLER

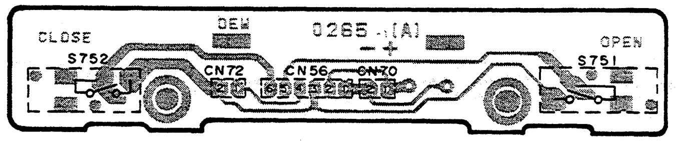
K OUTPUT LEVEL P.C.B. (RFKBV3900EBA)


CN913
S901
+4dBu
-10dBu
0474AF-3
OUTPUT LEVEL

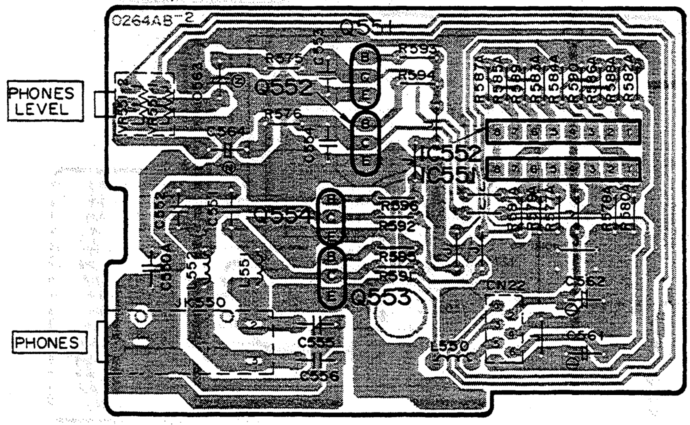
P TRAY MOTOR P.C.B. (REP0421A)


CN71
0265-(B)
C75
M
+
−
M751 TRAY MOTOR

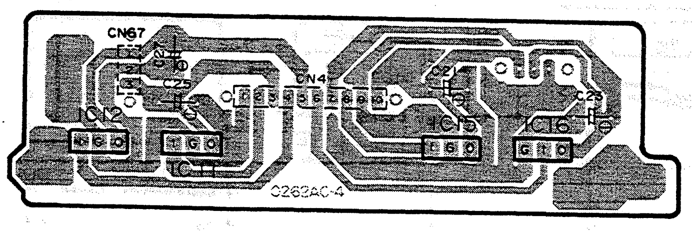
Q SWITCH P.C.B. (REP0421A)


CLOSE
S752
DEW
0265-(A)
CN72
CN56
CN70
OPEN
S751

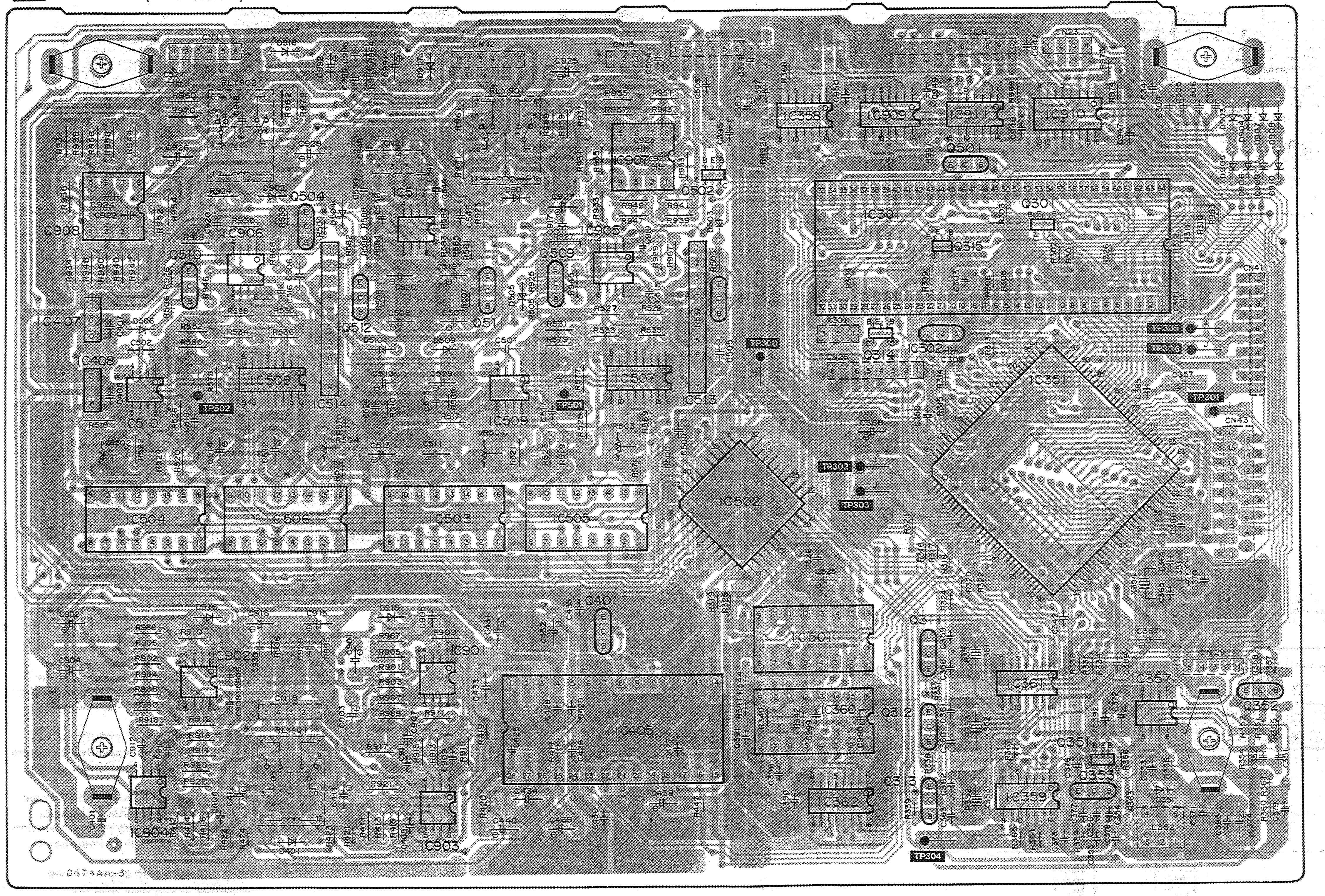
S HEADPHONES JACK P.C.B. (REP0694B)


0264AB-2
PHONES LEVEL
PHONES
Q551
Q552
Q553
Q554
IC551
IC552

C REGULATOR IC P.C.B. (REP0693B)


CN67
CN4
IC12
IC11
IC15
IC16
0262AC-4

I MAIN P.C.B. (RFKBV3900EBI)

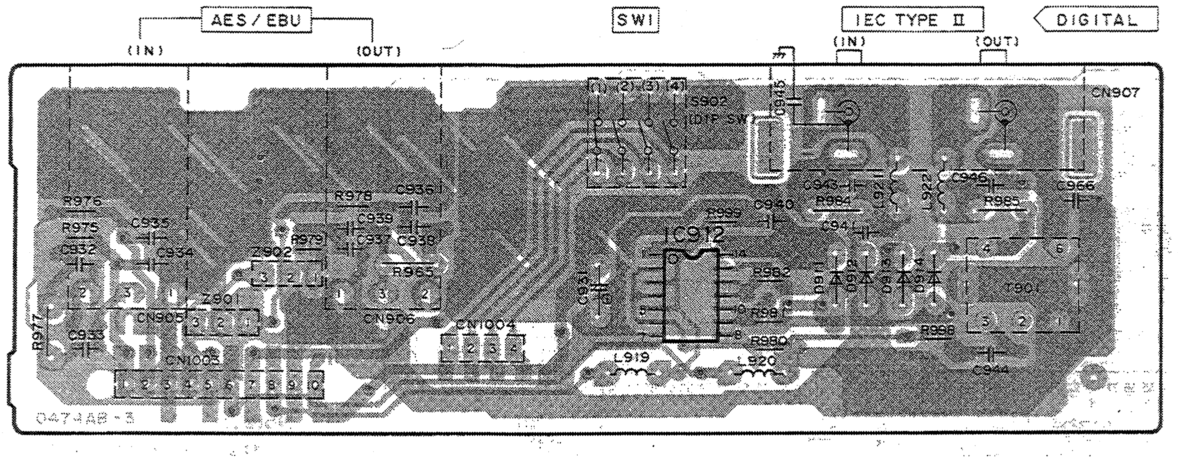

CN11
CN12
CN13
CN16
CN28
CN23
CN21
CN41
CN43
CN29
CN19
CN26
RLY902
RLY901
RLY401
IC908
IC906
IC907
IC905
IC511
IC514
IC513
IC407
IC408
IC508
IC510
IC509
IC507
IC504
IC506
IC503
IC505
IC502
IC358
IC909
IC911
IC910
IC301
IC302
IC351
IC352
IC501
IC360
IC362
IC361
IC359
IC357
IC902
IC901
IC405
IC904
IC903
Q504
Q510
Q512
Q511
Q509
Q502
Q501
Q301
Q315
Q314
Q401
Q311
Q312
Q313
Q351
Q352
Q362
TP300
TP301
TP302
TP303
TP304
TP305
TP306
TP501
TP502
VR501
VR502
VR503
VR504
X301
D401
0474AA-3

Notes:

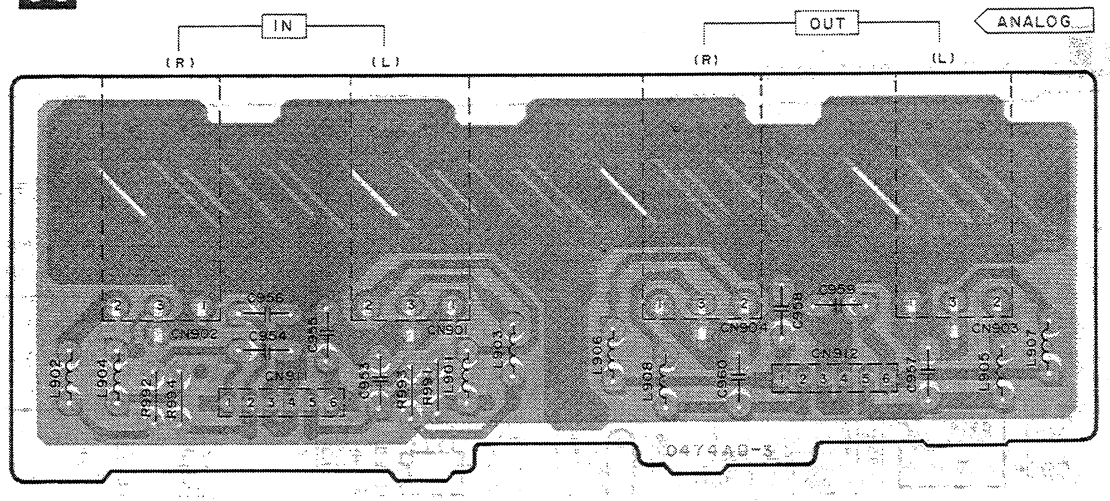
1. The circuit shown in (▨) on the conductor indicates printed circuit on the back side of the printed circuit board.
2. The circuit shown in (▨) on the conductor indicates printed circuit on the front side of the printed circuit board.
3. The symbols (•) shown in the circuit board indicate connection points between conductors on the front side and back side of the circuit board.

• This printed circuit board may be modified at any time with the developement of new technology.

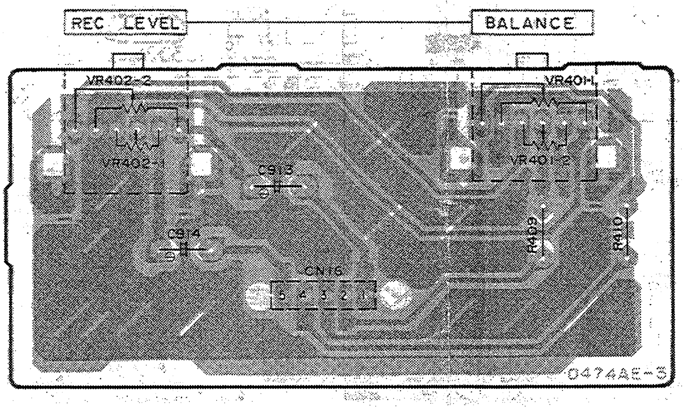
B DIGITAL IN/OUT TERMINAL P.C.B. **(RFKBV3900EBA)**


AES/EBU
(IN)
(OUT)
SW1
IEC TYPE II
(IN)
(OUT)
DIGITAL
CN907
S902 (DIP SW)
R976
R975
C932
C935
C934
Z902
R978
C936
C939
C937
C938
R979
R983
Z901
CN905
CN906
CN1004
CN1003
IC912
C931
R977
C933
L919
L920
R998
C944
T901
C945
R985
C966
C943
R984
C941
C940
R999
R982
R981
R980
0474AB-3

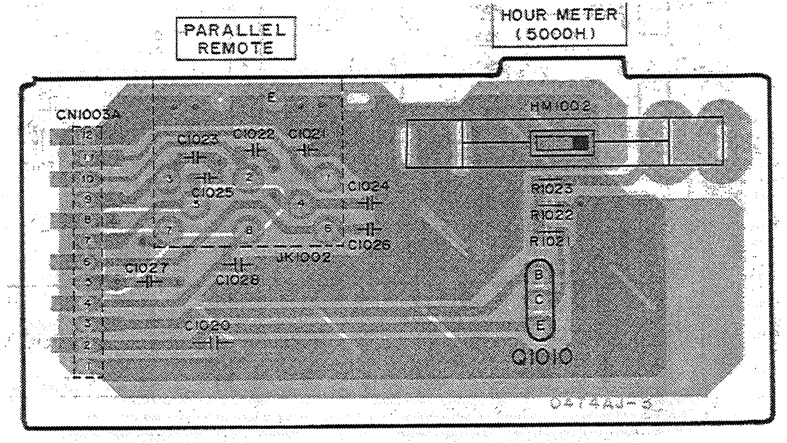
H ANALOG IN/OUT TERMINAL P.C.B. **(RFKBV3900EBA)**


IN
(R)
(L)
OUT
(R)
(L)
ANALOG
CN902
CN901
CN904
CN903
CN911
CN912
C956
C954
C955
C959
C958
C960
L902
L904
L903
L906
L908
L905
L907
R992
R994
R991
R993
0474AB-3

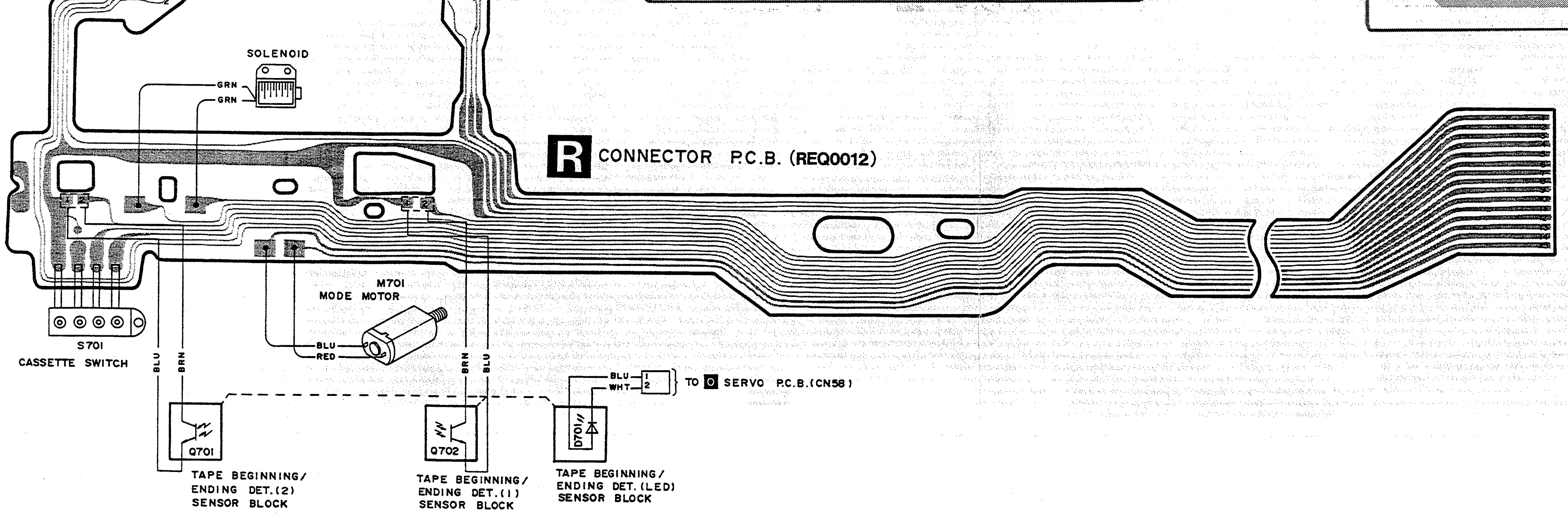
J BALANCE/REC LEVEL P.C.B. **(RFKBV3900EBA)**


REC LEVEL
BALANCE
VR402-2
VR402-1
VR401-2
VR401-1
C913
C914
CN16
R409
R410
0474AE-3

A PARALLEL REMOTE P.C.B. **(RFKBV3900EBA)**


PARALLEL REMOTE
HOUR METER (5000H)
CN1003A
HM1002
C1023
C1022
C1021
C1025
C1024
C1026
C1027
C1028
C1020
JK1002
R1023
R1022
R1021
B
C
E
Q1010
0474AJ-3

R CONNECTOR P.C.B. **(REQ0012)**

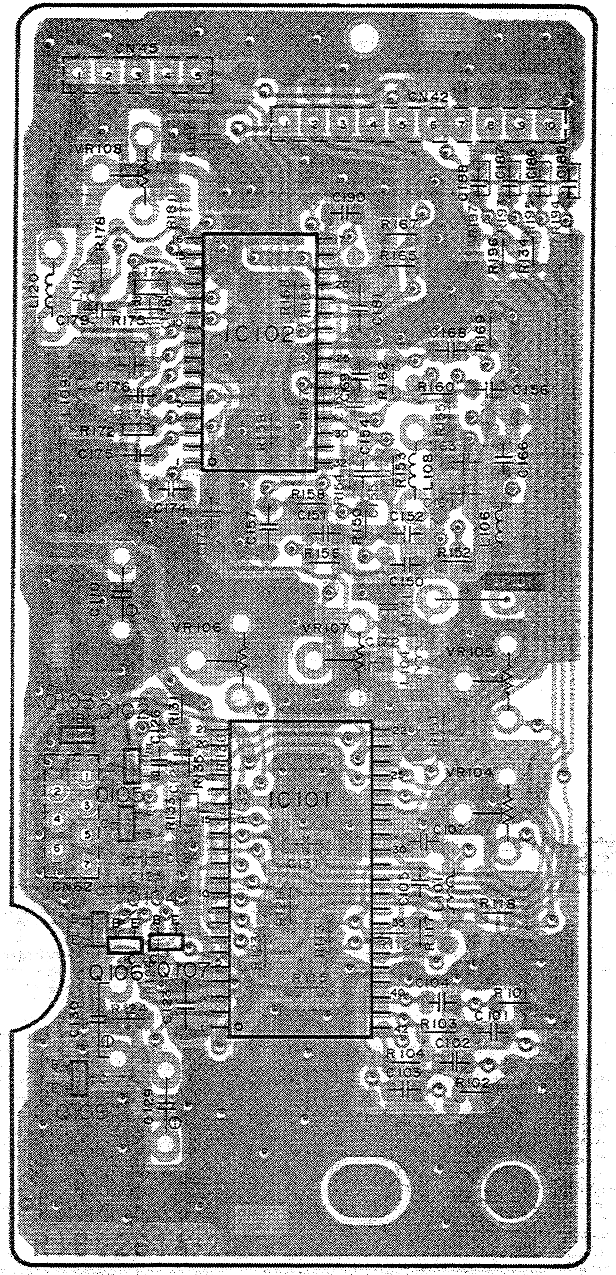

IC702
IC701
SOLENOID
GRN
GRN
M701
MODE MOTOR
BLU
RED
S701
CASSETTE SWITCH
BLU
BRN
BRN
BLU
BLU
WHT
TO O SERVO P.C.B.(CN58)
Q701
TAPE BEGINNING/ ENDING DET.(2) SENSOR BLOCK
Q702
TAPE BEGINNING/ ENDING DET.(1) SENSOR BLOCK
D701
TAPE BEGINNING/ ENDING DET.(LED) SENSOR BLOCK

Notes:

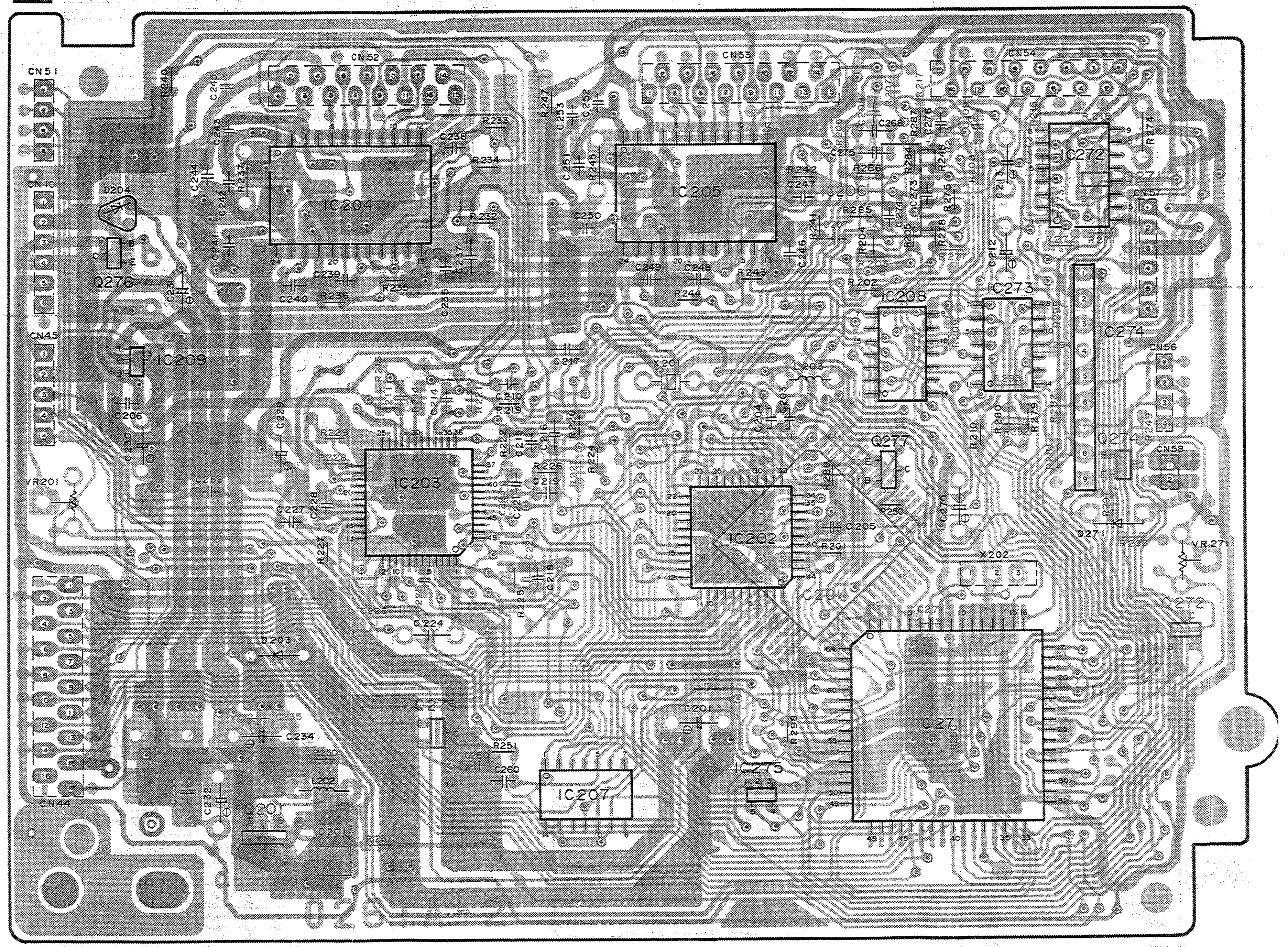
1. The circuit shown in (●━●) on the conductor indicates printed circuit on the back side of the printed circuit board.
2. The circuit shown in (●━●) on the conductor indicates printed circuit on the front side of the printed circuit board.
3. The symbols (•) shown in the circuit board indicate connection points between conductors on the front side and back side of the circuit board.

- **This printed circuit board may be modified at any time with the developement of new technology.**

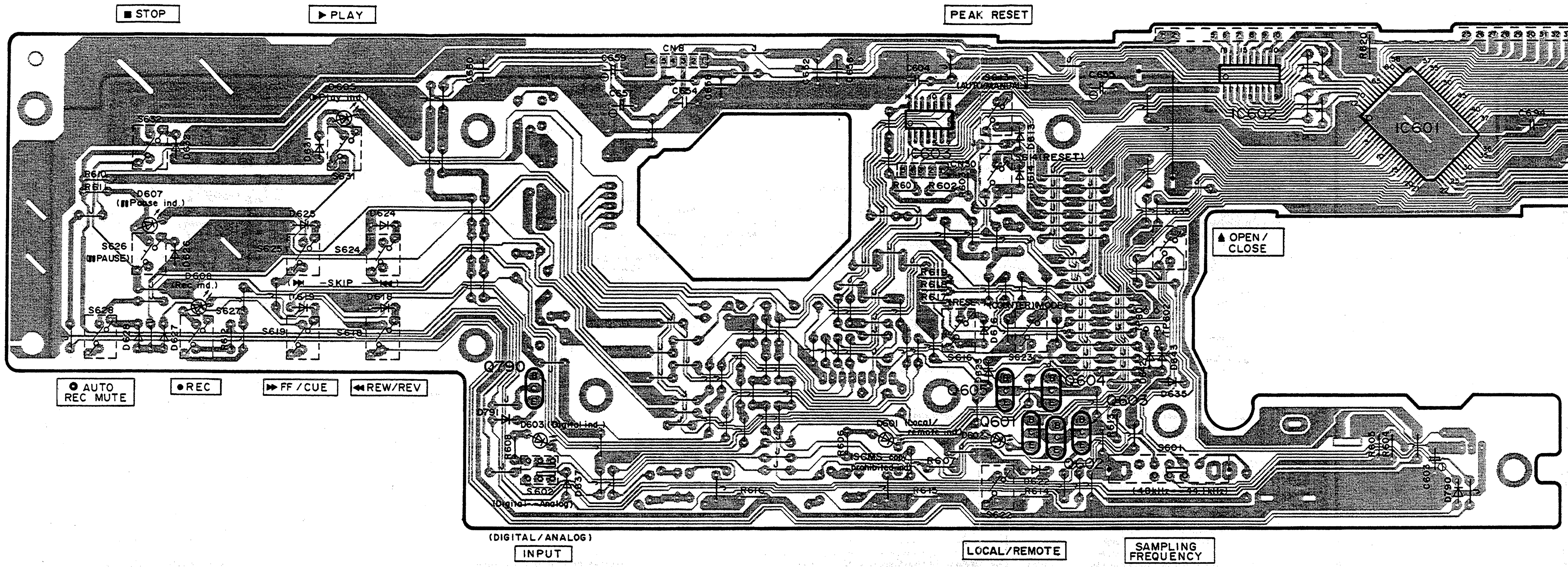
N RF P.C.B. (RFKBV3700-N)


CN45
CN42
VR108
IC102
VR106
VR107
VR105
VR104
IC101
CN52
Q103
Q101
Q105
Q106
Q107
Q109
L120
L108
L106
L110

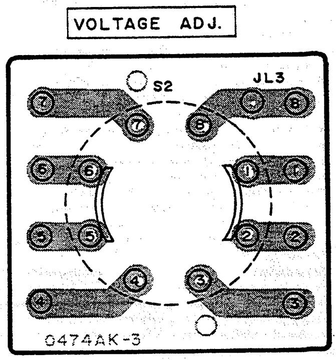
O SERVO P.C.B. (RFKBV3700-O)


CN51
CN52
CN53
CN54
CN10
CN45
CN44
CN56
CN57
CN58
D204
Q276
IC204
IC205
IC206
IC272
IC208
IC273
IC274
IC209
IC203
IC202
IC201
IC271
IC207
IC275
VR201
VR271
Q277
Q274
Q272
Q201
X201
X202
D203
D271
L202
L203

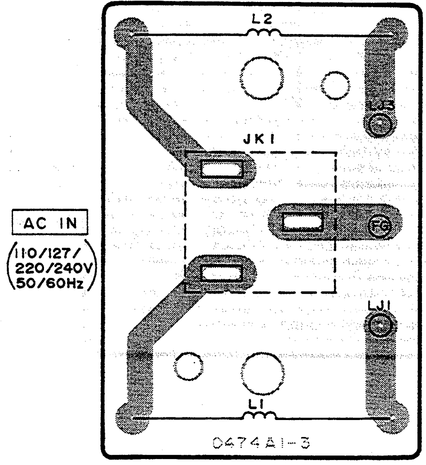
L OPERATION P.C.B. (REP0694B)


■ STOP
▶ PLAY
PEAK RESET
▲ OPEN/CLOSE
● AUTO REC MUTE
● REC
▶▶ FF/CUE
◀◀ REW/REV
(DIGITAL/ANALOG)
INPUT
LOCAL/REMOTE
SAMPLING FREQUENCY
IC601
IC602
IC603
FL601
CN8
Q790
Q601
Q602
Q603
Q604
Q605
S624
S625
S626 (PAUSE)
S627
S628
S619
S618
D607 (Pause ind.)
D608 (Rec ind.)
D603 (Digital ind.)
D624
D625
SKIP
0264AA-2

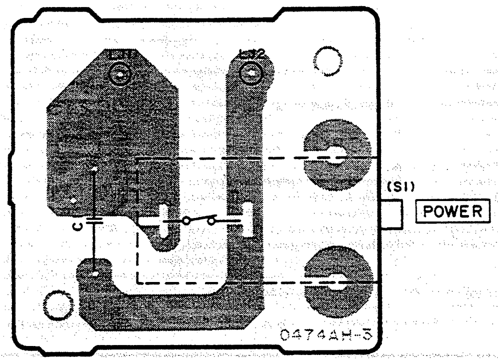
T VOLTAGE ADJ. P.C.B. (RFKBV3900EBA)


VOLTAGE ADJ.
S2
JL3
0474AK-3

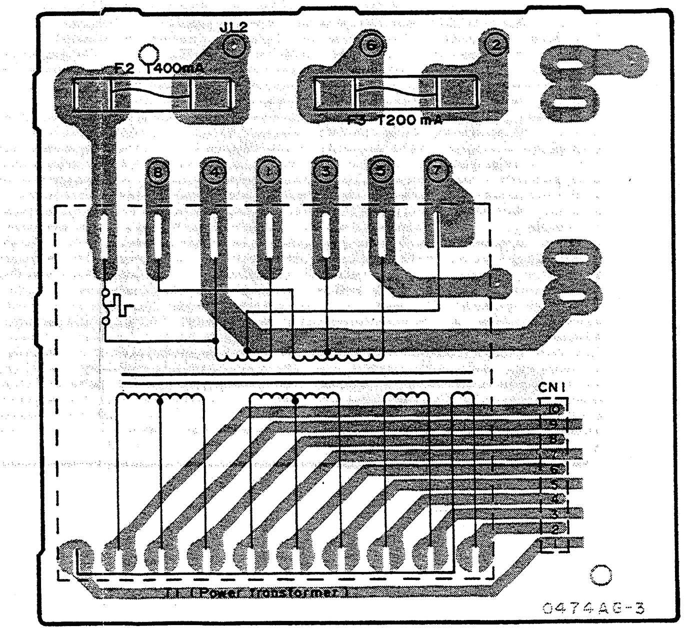
D AC IN P.C.B. (RFKBV3900EBA)


AC IN
110/127/220/240V 50/60Hz
L2
JK1
L1
LJ1
0474AI-3

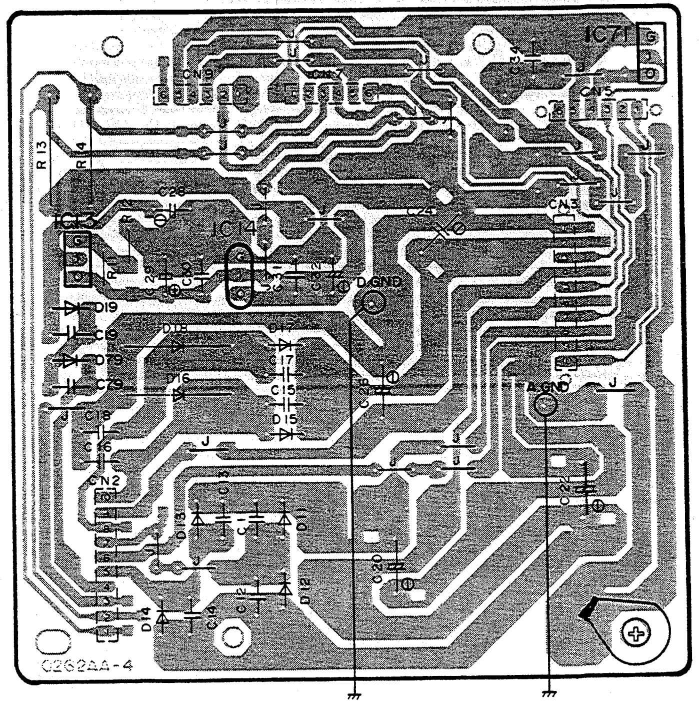
E POWER SWITCH P.C.B. (RFKBV3900EBA)


(S1)
POWER
L12
0474AH-3

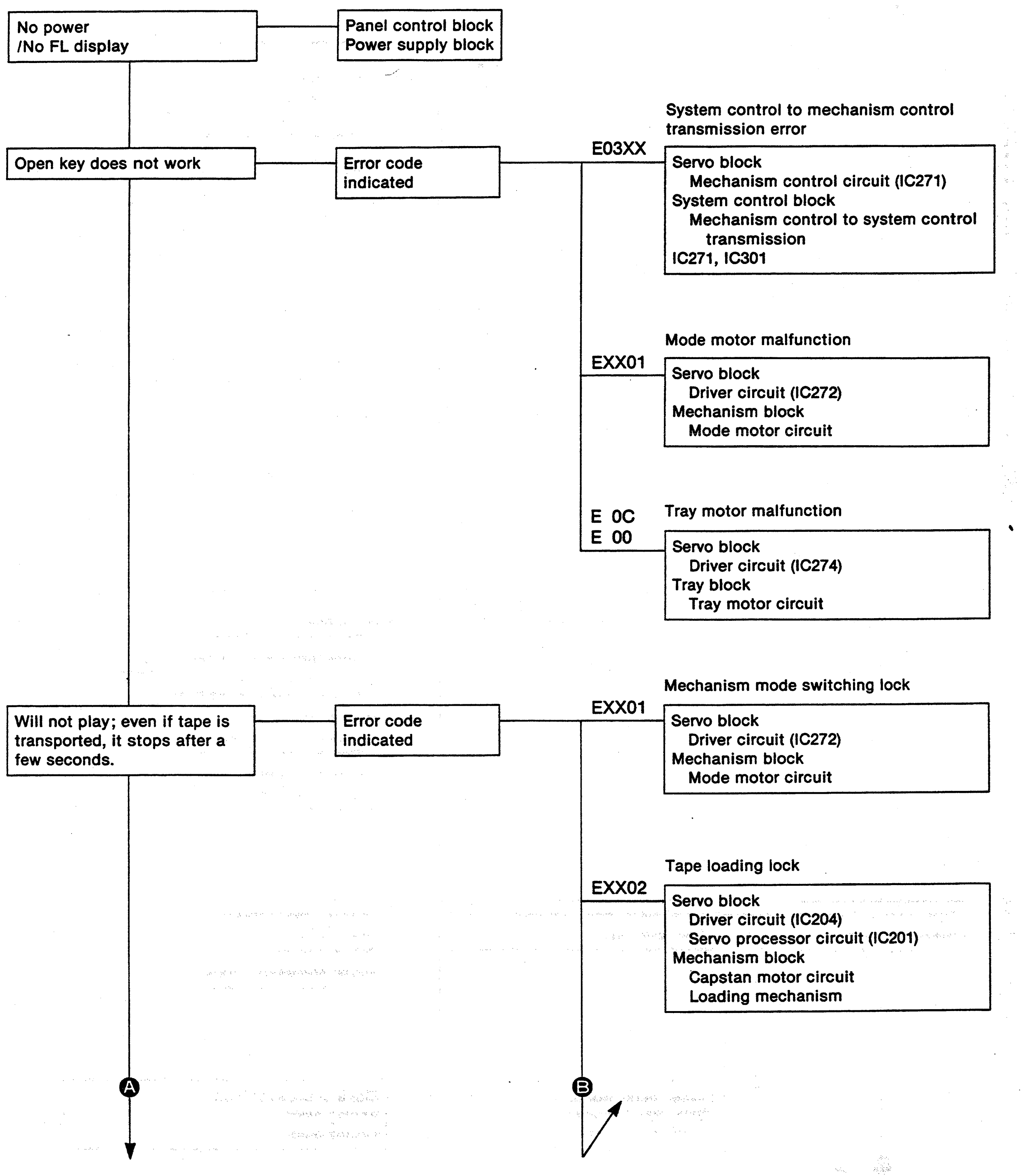
F POWER TRANSFORMER P.C.B. (RFKBV3900EBA)


JL2
F2 T400mA
F3 T200mA
CN1
T1 (Power transformer)
0474AG-3

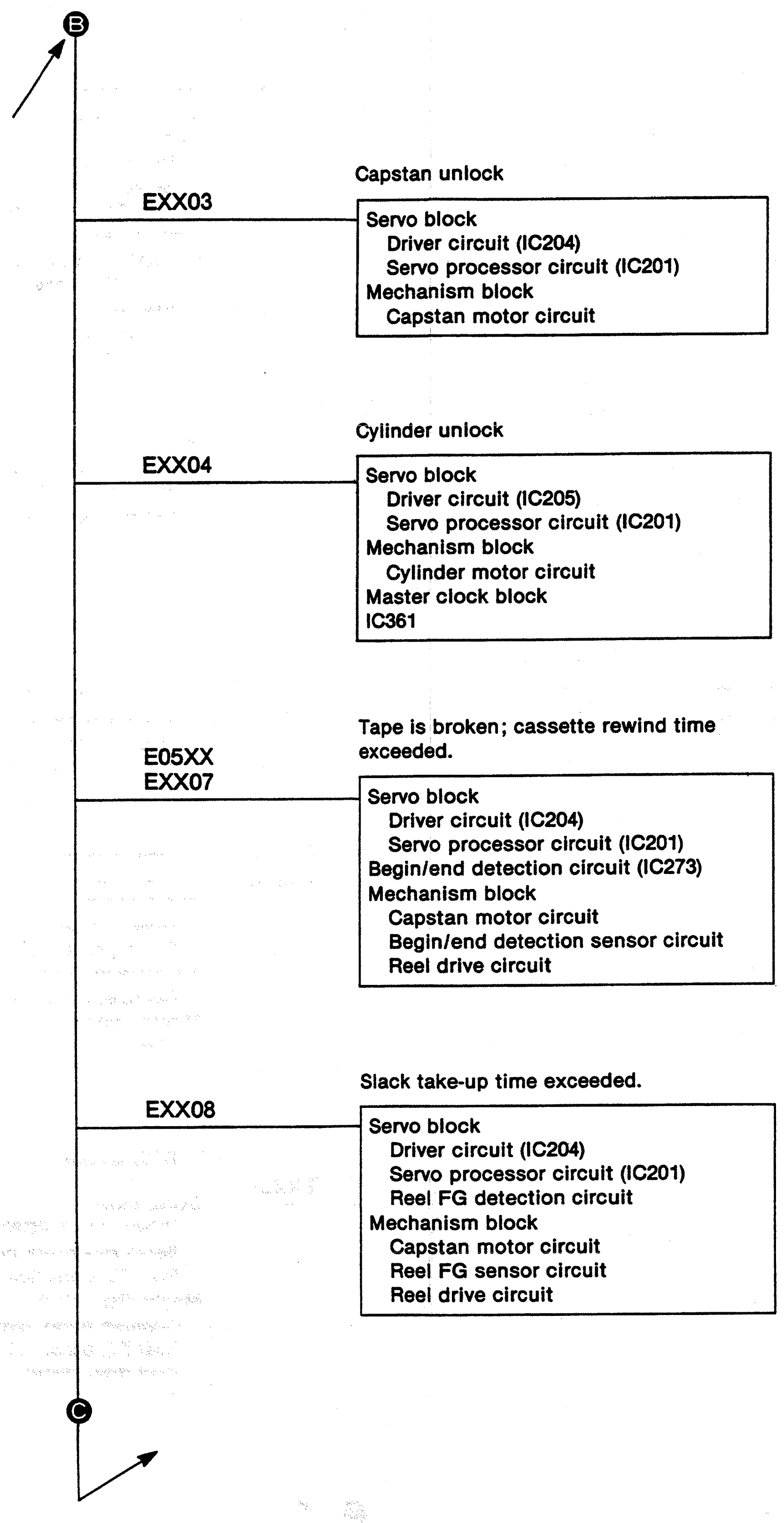
G POWER SUPPLY P.C.B. (REP0693B)


IC71
IC14
CN1
CN2
CN3
D.GND
A.GND
0262AA-4

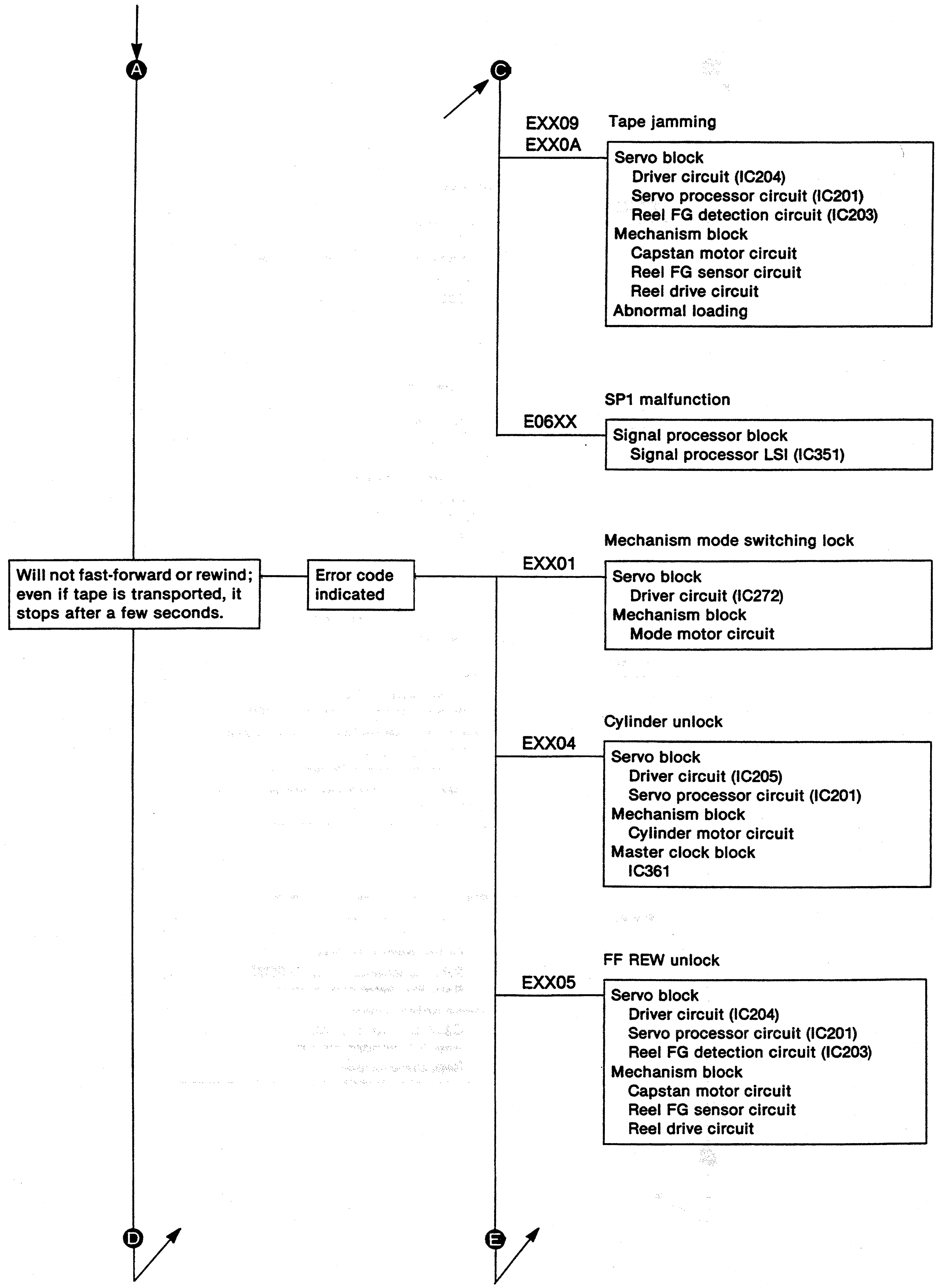
■TROUBLESHOOTING

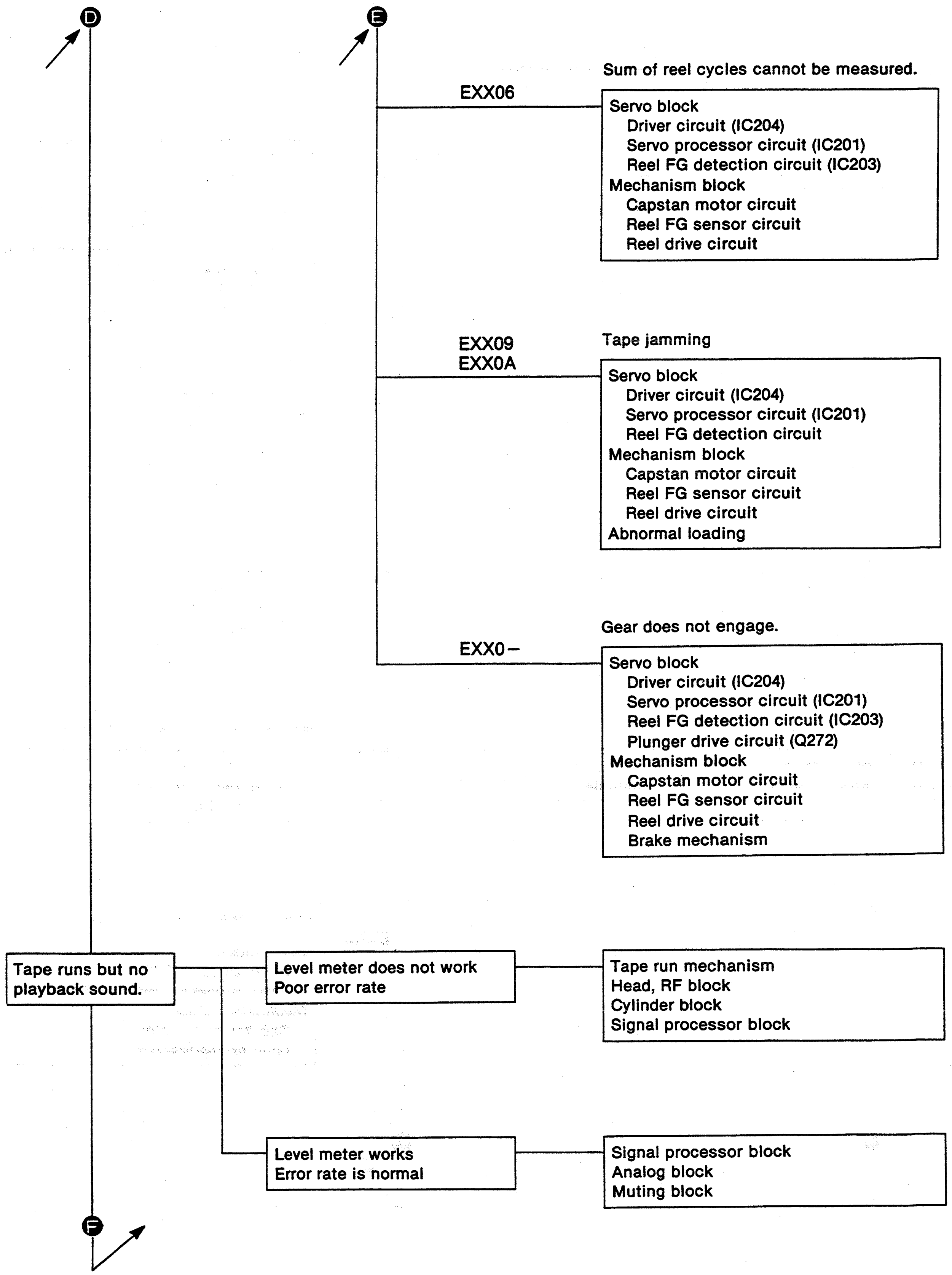


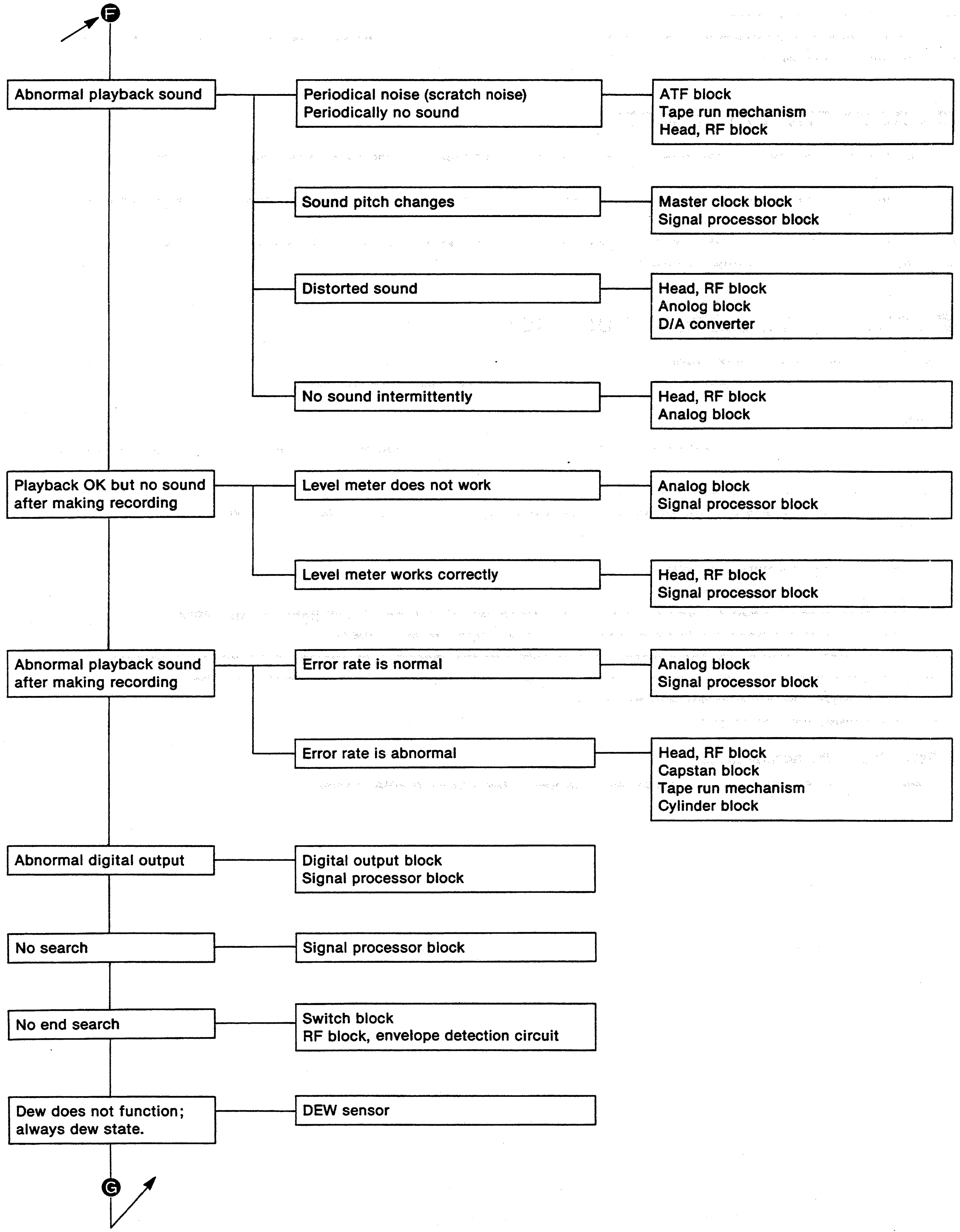
- No power /No FL display
  - Panel control block
    Power supply block
- Open key does not work
  - Error code indicated
    - E03XX — System control to mechanism control transmission error
      - Servo block
        - Mechanism control circuit (IC271)
      - System control block
        - Mechanism control to system control transmission
      - IC271, IC301
    - EXX01 — Mode motor malfunction
      - Servo block
        - Driver circuit (IC272)
      - Mechanism block
        - Mode motor circuit
    - E 0C / E 00 — Tray motor malfunction
      - Servo block
        - Driver circuit (IC274)
      - Tray block
        - Tray motor circuit
- Will not play; even if tape is transported, it stops after a few seconds.
  - Error code indicated
    - EXX01 — Mechanism mode switching lock
      - Servo block
        - Driver circuit (IC272)
      - Mechanism block
        - Mode motor circuit
    - EXX02 — Tape loading lock
      - Servo block
        - Driver circuit (IC204)
        - Servo processor circuit (IC201)
      - Mechanism block
        - Capstan motor circuit
        - Loading mechanism
    - Ⓑ
- Ⓐ

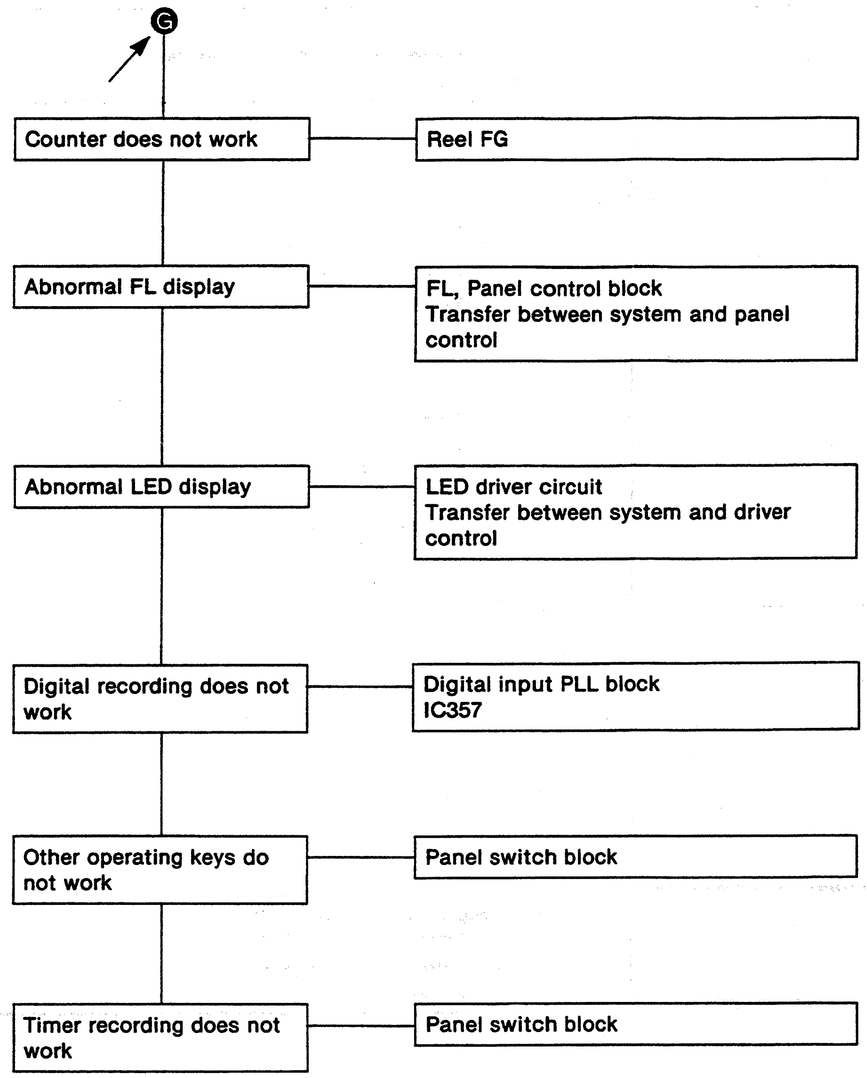


- Ⓑ
  - EXX03 — Capstan unlock
    - Servo block
      - Driver circuit (IC204)
      - Servo processor circuit (IC201)
    - Mechanism block
      - Capstan motor circuit
  - EXX04 — Cylinder unlock
    - Servo block
      - Driver circuit (IC205)
      - Servo processor circuit (IC201)
    - Mechanism block
      - Cylinder motor circuit
    - Master clock block
    - IC361
  - E05XX / EXX07 — Tape is broken; cassette rewind time exceeded.
    - Servo block
      - Driver circuit (IC204)
      - Servo processor circuit (IC201)
    - Begin/end detection circuit (IC273)
    - Mechanism block
      - Capstan motor circuit
      - Begin/end detection sensor circuit
      - Reel drive circuit
  - EXX08 — Slack take-up time exceeded.
    - Servo block
      - Driver circuit (IC204)
      - Servo processor circuit (IC201)
      - Reel FG detection circuit
    - Mechanism block
      - Capstan motor circuit
      - Reel FG sensor circuit
      - Reel drive circuit
  - Ⓒ


A
C
EXX09
EXX0A
Tape jamming
Servo block
Driver circuit (IC204)
Servo processor circuit (IC201)
Reel FG detection circuit (IC203)
Mechanism block
Capstan motor circuit
Reel FG sensor circuit
Reel drive circuit
Abnormal loading
E06XX
SP1 malfunction
Signal processor block
Signal processor LSI (IC351)
Will not fast-forward or rewind; even if tape is transported, it stops after a few seconds.
Error code indicated
EXX01
Mechanism mode switching lock
Servo block
Driver circuit (IC272)
Mechanism block
Mode motor circuit
EXX04
Cylinder unlock
Servo block
Driver circuit (IC205)
Servo processor circuit (IC201)
Mechanism block
Cylinder motor circuit
Master clock block
IC361
EXX05
FF REW unlock
Servo block
Driver circuit (IC204)
Servo processor circuit (IC201)
Reel FG detection circuit (IC203)
Mechanism block
Capstan motor circuit
Reel FG sensor circuit
Reel drive circuit
D
E


D
E
EXX06
Sum of reel cycles cannot be measured.
Servo block
Driver circuit (IC204)
Servo processor circuit (IC201)
Reel FG detection circuit (IC203)
Mechanism block
Capstan motor circuit
Reel FG sensor circuit
Reel drive circuit
EXX09
EXX0A
Tape jamming
Servo block
Driver circuit (IC204)
Servo processor circuit (IC201)
Reel FG detection circuit
Mechanism block
Capstan motor circuit
Reel FG sensor circuit
Reel drive circuit
Abnormal loading
EXX0−
Gear does not engage.
Servo block
Driver circuit (IC204)
Servo processor circuit (IC201)
Reel FG detection circuit (IC203)
Plunger drive circuit (Q272)
Mechanism block
Capstan motor circuit
Reel FG sensor circuit
Reel drive circuit
Brake mechanism
Tape runs but no playback sound.
Level meter does not work
Poor error rate
Tape run mechanism
Head, RF block
Cylinder block
Signal processor block
Level meter works
Error rate is normal
Signal processor block
Analog block
Muting block
F


F
Abnormal playback sound
Periodical noise (scratch noise)
Periodically no sound
ATF block
Tape run mechanism
Head, RF block
Sound pitch changes
Master clock block
Signal processor block
Distorted sound
Head, RF block
Anolog block
D/A converter
No sound intermittently
Head, RF block
Analog block
Playback OK but no sound after making recording
Level meter does not work
Analog block
Signal processor block
Level meter works correctly
Head, RF block
Signal processor block
Abnormal playback sound after making recording
Error rate is normal
Analog block
Signal processor block
Error rate is abnormal
Head, RF block
Capstan block
Tape run mechanism
Cylinder block
Abnormal digital output
Digital output block
Signal processor block
No search
Signal processor block
No end search
Switch block
RF block, envelope detection circuit
Dew does not function; always dew state.
DEW sensor
G


G
Counter does not work
Reel FG
Abnormal FL display
FL, Panel control block
Transfer between system and panel control
Abnormal LED display
LED driver circuit
Transfer between system and driver control
Digital recording does not work
Digital input PLL block
IC357
Other operating keys do not work
Panel switch block
Timer recording does not work
Panel switch block

■ KEY POINTS FOR TROUBLESHOOTING

Mechanism block
- Loading mechanism
  - Post roller
  - Tension regulator
  - Pinch roller
  - Brake lever
- Brake mechanism
  - Brake lever
  - Solenoid
  - Solenoid driver
- Mechanism switch block
  - Tape hole detection switch
  - Cassette detection switch
  - Holder switch
- Reel FG block
  - Detection photo transistor
  - Detection LED
  - Reel FG amp (servo P.C.B.)
- FPC & FPC connector

Mode motor block
- Mode motor
- Mode switch
- Mode motor driver circuit

Master clock block
- 28MHz oscillator
- 16MHz, 22MHz, 24MHz oscillate and select circuit

Panel switch block
- Switch
- Panel control IC

Head, RF block
- Head FPC & FPC connector
- Head dirty
- Head cracked or damaged
- RF recording current
- Playback eye pattern

Tape begin/end detection block
- Begin/end detection photo transistor
- Begin/end detection LED
- Comparator circuit
- FPC & FPC connector

Power supply block
- Power supply regulator output
- Fuse

Capstan block
- Capstan FG
- FG amp
- Motor driver output
- Motor current

Cylinder block
- Cylinder FG
- Cylinder PG
- FG amp
- PG amp
- Motor driver output
- Motor current

ATF block
- RF ATF output
  - ATF SYNC output
- ATF select circuit
- ATF gate allay

Signal processor block
- Data & clock to D/A
- Data & clock to A/D
- All clocks

Digital output block
- Digital output PB

Panel control block
- Panel control block
- Transfer between panel and system control
- Panel control reset

Analog block
- Input amplifier
- Output amplifier
- Muting circuit
- A/D converter
- D/A converter

■ ABOUT THE ERROR RATE

If the error rate is normal, it can be judged that everything up to signal processing, meaning the operation of the RF head mechanism, is normal.
Thus, when there is a problem with playback, if the error is normal, it can be assumed that the origin of the problem is in the analog system.

■ ABOUT THE LEVEL METER

Just as for the error rate, if the level meter is operating normally, it indicates that the signal is reaching signal processing.
In other words, if there is no problem with the level meter during playback, it indicates that the head and the RF are outputting the signal.
In addition, if there is no problem with the level meter during recording, it indicates that the analog system (input amplifier and AD) is functioning normally.

■ ERROR RATE DISPLAY FUNCTION

1. **Setting the error rate display mode**

   Simultaneously press the counter mode key, the counter reset key, and the pause key.

   Note:

   If the counter reset key is released before the other keys, the mode will not change to the error rate display mode.

   (1) The digital input mode will be displayed:
   If "AES" is displayed, it indicates the AES/EBU mode. If "IEC-2" mode is displayed, it indicates the IEC Type II mode.

2. **Changing to the following displays**

   Press the counter mode key successively.

   (2) The error rates for head A and head B will be displayed: FLs A and B will light up (max 9984).
   (3) The error rate for head A will be displayed: FL A will light up (max 4992).
   (4) The operation modes for the system control (left) and the mechanism control (right) will be displayed.
   (5) The error codes for the system control (left) and the mechanism control (right) will be displayed. (If the tray is open, the error codes will be cleared.)
   (6) The display will return to (1).

3. **Returning to the normal mode**

   Press the counter reset key: the mode will change to the A time display mode.

ERROR CODE TABLE

Error code (Note. 1)	System control error code		Mechanism control error code	
	Processing (Note 2)	Contents	Processing (Note 2)	Contents
1	Test operation	R3CP clock malfunction	Unload	Mechanism mode switching lock
2	Test operation	HSW clock malfunction	Unload	Tape loading lock
3	Transmission omitted	Faulty transmission of the mechanism control	Unload	Capstan unlock
4	Unload	Still protection during operation	Unload	Cylinder unlock
5	Unload	Broken tape	Unload	Reel unlock
6	Unload	Faulty transmission of SP1	Unload	Sum of reel cycles cannot be measured.
7			Unload	In-cassette rewind time exceeded.
8			Unload	Slack tape-up time exceeded.
9			Unload	Tape jamming (Supply side)
A			Unload	Tape jamming (Take-up side)
B (−)			Unload	Gear does not engage.
C			Tray stop	Initial tray setting not possible.
O		——		No error
FF (blank)		No error		——

Note 1: Display mode

E X1 X2

E: Indicates that mode is the error rate display mode.
X1: System control error code
X2: Mechanism control error code

Note 2: Processing when an error occurs

Test operation:
Internal clock of the system control temporarily connects for operation.
Transmission omitted:
Transmission processing stopped.
Unload:
Tape is unloaded.

REPLACEMENT PARTS LIST

Notes : * *Important safety notice:*
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
* The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)
Parts without these indications can be used for all areas.

Ref. No.	Part No.	Part Name & Description	Remarks
		INTEGRATED CIRCUIT(S)	
IC11	AN7812F	IC, REGULATOR	
IC12	AN7805F	IC, REGULATOR	
IC13	AN79M20F	IC, REGULATOR	
IC14	AN79L20	IC, REGULATOR	
IC15	M5F78M12L	IC, REGULATOR	
IC16	M5F79M12L	IC, REGULATOR	
IC71	AN79N05	IC, REGULATOR	
IC101	AN7030SE2	IC, RF AMP	
IC102	AN7035SCE2	IC, PLAYBACK PLL	
IC201	MN6742SDR	IC, SERVO PROCESSOR	
IC202	MN53020SDQ	IC, ATF	
IC203	AN8320NFA	IC, LINEAR SERVO	
IC204, 205	AN3841SR	IC, MOTOR DRIVE	
IC206	M5228FPE2	IC, ANALOG SWITCH	
IC207	UPD74HC04GE2	IC, INVERTER	
IC208	MN4066BS-T2	IC, ANALOG SWITCH	
IC209	AN78L05ME2	IC, REGULATOR	
IC271	MN17541SDN2	IC, MECHANISM CONTROL	
IC272	AN6607NSE2	IC, MOTOR DRIVE	
IC273	AN1339SE2	IC, VOLTAGE CONTROL	
IC274	TA7291S	IC, TRAY MOTOR CONTROL	
IC275	TC4S81FTX	IC, AND GATE	
IC301	MN188161SDL	IC, SYSTEM CONTROL	
IC302	MN1281R-TA	IC, RESET GENERATOR	
IC351	MN6624	IC, DIGITAL SIGNAL PROCESSOR	
IC352	SRM20256LM10	IC, S. RAM	
IC357	M5238FPE1	IC, DIGITAL INPUT PLL	
IC358, 359	MN74HC00S	IC, NAND GATE	
IC360	CD74HC4046A	IC, DF PLL	
IC361	MN74HCU04S	IC, INVERTER	
IC362	UPD74HC163G	IC, BINARY COUNTER	
IC405	AK5326-VP	IC, A/D CONVERTER	
IC407	M5F78M05L	IC, REGULATOR	
IC408	M5F79M05L	IC, REGULATOR	
IC501	YM3404B	IC, DIGITAL FILTER	
IC502	MN53010PEH	IC, SERIAL/PARALLEL CONV.	
IC503-506	PCM56P-J	IC, D/A CONVERTER	
IC507, 508	UPD4053BGT	IC, SAMPLING HOLD	
IC509, 510	M5238FPE1	IC, OP. AMP	
IC511	M5219FPE1	IC, BUFFER	
IC513, 514	SVHHAF0614	IC, L. P. F.	
IC551, 552	M5218L	IC, CLASS AA AMP	
IC601	M50754-165FP	IC, PANEL CONTROL	
IC602	AN6873S	IC, INVERTER	
IC603	UPD74HC04G	IC, INVERTER	
IC801	M37450M4-356	IC, MICROCOMPUTER	
IC802	M5M34050P	IC, DUAL TRANSCEIVER	
IC803, 804	UPD4021BC	IC, DATA DETECTOR	
IC805, 806	UPD4094BC	IC, DATA DETECTOR	
IC807	M74HC541P	IC, 3-STATE BUFFER	
IC808	M74HC393P	IC, 4-BIT BINARY COUNTER	
IC809	M74HC00P	IC, NAND GATE	
IC810	M74HC04P	IC, INVERTER	
IC811	M74HC4040P	IC, RIPPLE COUNTER	
IC812	M74HC153P	IC, DATA SELECTOR	
IC901, 902	NJM5532MDT	IC, BUFFER AMP	
IC903, 904	M5219FPE1	IC, BUFFER AMP	
IC905, 906	NJM5532MDT	IC, SAMPLING HOLD	
IC907, 908	NJM5532DD	IC, BUFFER AMP	
IC909	UPD4066BG-T1	IC, ANALOG SWITCH	
IC910	M5M34050FTP2	IC, AES/EBU SELECTOR	
IC911	UPD74HC04GE2	IC, INVERTER	
IC912	T74HCU04AFTP	IC, INVERTER	
		TRANSISTOR(S)	
Q102-105	UN5216-Q	TRANSISTOR	
Q106, 107	2SC3937TW	TRANSISTOR	
Q109	UN5216-Q	TRANSISTOR	
Q201	2SB956R	TRANSISTOR	
Q271	2SD1280STW	TRANSISTOR	
Q272	DTA123JKTW	TRANSISTOR	
Q274	2SB709RTW	TRANSISTOR	
Q275	DTC124EKTW	TRANSISTOR	
Q276	DTB113ZKTW	TRANSISTOR	
Q277	DTA114EKTW	TRANSISTOR	
Q301	XN1212TW	TRANSISTOR	
Q311-313	2SC3315CTA	TRANSISTOR	
Q314, 315	XN1112TW	TRANSISTOR	
Q351	XN1212TW	TRANSISTOR	
Q352	2SA1309A-R	TRANSISTOR	
Q353	2SC1047DTA	TRANSISTOR	
Q401	UN4212TA	TRANSISTOR	
Q501	UN4124TA	TRANSISTOR	
Q502	XN1112TW	TRANSISTOR	
Q503, 504	2SC3315CTA	TRANSISTOR	
Q509, 510	2SC3315CTA	TRANSISTOR	
Q511	2SC3311A-Q	TRANSISTOR	
Q512	2SA1309A-R	TRANSISTOR	
Q551-554	2SD1450RTA	TRANSISTOR	
Q601-605	UN4111	TRANSISTOR	

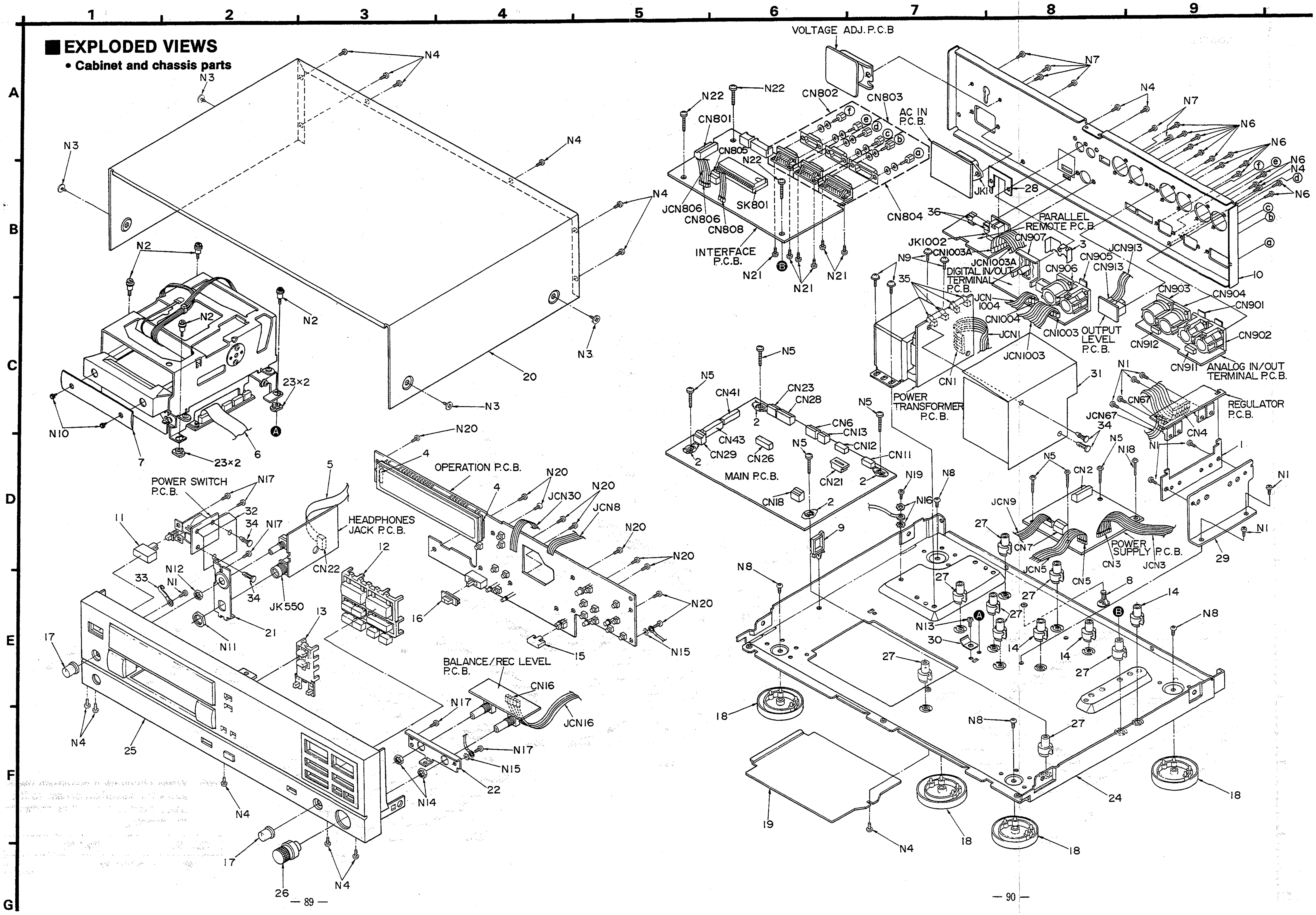
Ref. No.	Part No.	Part Name & Description	Remarks
Q790	UN4111	TRANSISTOR	
Q1010	UN4114TA	TRANSISTOR	
		DIODE(S)	
D11-15	1SR35200TB	DIODE	⚠
D16	SVDS2V20	DIODE	⚠
D17	1SR35200TB	DIODE	⚠
D18	SVDS2V20	DIODE	⚠
D19	1SR35200TB	DIODE	⚠
D79	1SR35200TB	DIODE	⚠
D201	MA701TX	DIODE	
D203	1N4606TR	DIODE	
D204	MA151ATW	DIODE	
D271	1S2473TR	DIODE	
D351	RVDSVC321	DIODE	
D401	MA165	DIODE	
D503-506	MA165	DIODE	
D509, 510	MA719TA	DIODE	
D601-603	LN28RCPP-JF	L. E. D.	
D605	LN31GPH-JF2	L. E. D.	
D607	LN49YPH-JF1	L. E. D.	
D608	LN29RPH-JF1	L. E. D.	
D613, 614	MA165	DIODE	
D616	MA165	DIODE	
D618, 619	MA165	DIODE	
D622-628	MA165	DIODE	
D631, 632	MA165	DIODE	
D635	MA165	DIODE	
D637	MA165	DIODE	
D642, 643	MA165	DIODE	
D790, 791	MA165	DIODE	
D801-808	MA165	DIODE	
D901-914	MA165	DIODE	
D915-918	MA719TA	DIODE	
		VARIABLE RESISTOR(S)	
VR104, 105	EVNDXAA00B53	V. R, RF RECORDING LEVEL ADJ.	
VR106	EVNDXAA00B14	V. R, RF RECORDING LEVEL ADJ.	
VR107, 108	EVNDXAA00B13	V. R, ATF GAIN ADJ.	
VR201	EVNDXAA00B54	V. R, PG PHASE ADJ.	
VR271	EVNDCAA03B54	V. R, TAPE BEGIN/END DET. ADJ.	
VR401	EVJC51F04703	V. R, REC BALANCE	
VR402	EVJC20F02A24	V. R, REC LEVEL	
VR501, 502	EVNDXAA00B53	V. R, DAC OUTPUT BALANCE ADJ.	
VR503, 504	EVNDXAA00B15	V. R, DAC OFF-SET ADJ.	
VR551	EVU57A022A14	V. R, HEADPHONES LEVEL	
		COMPONENT COMBINATION(S)	
Z901, 902	EXCEMT471BT	COMPONENT COMBINATION	

Ref. No.	Part No.	Part Name & Description	Remarks
		COIL(S)	
L1, 2	SLQX400-D	COIL	⚠
L101	ELJFA470KF	COIL	
L104	ELJFA180KF	COIL	
L106	ELJFA101KF	COIL	
L108	RLQZB471KT-D	COIL	
L109, 110	ELJFA180KF	COIL	
L120	RLQZB101KT-D	COIL	
L202	RLM9R001-Z	COIL	
L203	RLQZB101KT-D	COIL	
L351	RLQZB2R2KT-D	COIL	
L352	RL03B002-M	COIL	
L550-552	EXCELDR35V	COMBINATION PART	
L801-807	EXCELDR35V	COMBINATION PART	
L901-908	EXCELDR35V	COMBINATION PART	
L919-922	EXCELDR35V	COMBINATION PART	
		TRANSFORMER(S)	
T1	SLT5M523	POWER TRANSFORMER	⚠
T901	RLZ0006-0	TRANSFORMER	
		OSCILLATOR(S)	
X201	RSXC8M00J01T	OSCILLATOR	
X202	RSXY8M00M01T	OSCILLATOR	
X301	RSXY8M00M01T	OSCILLATOR	
X351	RSXC16M3J01	OSCILLATOR	
X352	RSXC22M5J01	OSCILLATOR	
X353	RSXC24M5J01	OSCILLATOR	
X354	RSXA28M2J01	OSCILLATOR	
X601	RSXY6M00M01T	OSCILLATOR	
X801	RSXB9M83M01	OSCILLATOR	
		DISPLAY TUBE	
FL601	RSL0062-F	DISPLAY TUBE	
		FUSE(S)	
F2	XBA2C04TB0S	FUSE, 250V 400mA	⚠
F3	XBA2C02TB0S	FUSE, 250V 200mA	⚠
		SWITCH(ES)	
S1	ESB8249V	SW, POWER	⚠
S2	ESE37263	SW, VOLTAGE ADJ.	⚠
S601	ESD1511201	SW, SAMPLING FREQ. SELECTOR	
S602	ESB64801	SW, ANALOG/DIGITAL SELECTOR	
S613	EVQQTG05R	SW, AUTO/MANUAL	

Ref. No.	Part No.	Part Name & Description	Remarks
S614	EVQQTG05R	SW, RESET	
S616	EVQQTG05R	SW, COUNTER RESET	
S618	EVQQTG05R	SW, REW	
S619	EVQQTG05R	SW, FF	
S622	EVQQTG05R	SW, LOCAL/REMOTE	
S623	EVQQTG05R	SW, COUNTER MODE	
S624	EVQQTG05R	SW, REVERSE SKIP	
S625	EVQQTG05R	SW, FORWARD SKIP	
S626	EVQQTG05R	SW, PAUSE	
S627	EVQQTG05R	SW, REC	
S628	EVQQTG05R	SW, AUTO REC MUTE	
S631	EVQQTG05R	SW, PLAY	
S632	EVQQTG05R	SW, STOP	
S635	EVQQTG05R	SW, OPEN/CLOSE	
S701	EVQWR4002	SW, TAPE HOLE DET.	
S702	EVQWXN001	SW, LOAD DET.	
S703	EVQWXM001	SW, MODE DET.	
S751, 752	SSPD18-1	SW, LEAF (OPEN/CLOSE)	
S801	RST1H001	SW, DIP	
S802	RST1D001	SW, DIP	
S901	SSS189	SW, OUTPUT LEVEL SELECTOR	
S902	RST1D001	SW, DIP	
		JACK(S)&SOCKET(S)	
JK1	SJVD06	AC INLET	⚠
JK550	SJJD19	HEADPHONES	
JK1002	QJS1955H	PARALLEL REMOTE	
SK801	RJS1E0164	IC SOCKET	
		CONNECTOR(S) & TERMINAL(S)	
CN1	RHR197ZA	CONNECTOR(10P)	
CN2	SJSD1005	CONNECTOR(10P)	
CN3, 4	RHR197ZA	CONNECTOR(10P)	
CN5	RHR193ZA	CONNECTOR(6P)	
CN6, 7	RJS6T4ZA	CONNECTOR(6P)	
CN10-12	RJP6G27ZA	CONNECTOR(6P)	
CN13	RJS3T4ZA	CONNECTOR(3P)	
CN16	RHR192ZA	CONNECTOR(5P)	
CN18	RJS5T4ZA	CONNECTOR(5P)	
CN21, 22	RJS6Q8ZA	CONNECTOR(6P)	
CN23	RJS4T4ZA	CONNECTOR(4P)	
CN26	RJP8G27ZA	CONNECTOR(8P)	
CN28	RJP10G27ZA	CONNECTOR(10P)	
CN29	RJS5T4ZA	CONNECTOR(5P)	
CN41	RJP10G27ZA	CONNECTOR(10P)	
CN43, 44	SJSD1721	CONNECTOR(17P)	
CN45	RJP5G27ZA	CONNECTOR(5P)	
CN51	RJP3G27ZA	CONNECTOR(3P)	
CN52-54	RJU051W015	CONNECTOR(15P)	
CN56	RJP4G28ZA	CONNECTOR(4P)	
CN57	RJP6G28ZA	CONNECTOR(6P)	
CN58	RJT036W002	CONNECTOR(2P)	
CN62	RJS7Q11ZA	CONNECTOR(7P)	
CN67	RHR190ZA	CONNECTOR(3P)	
CN801	SJSD1205	CONNECTOR(12P)	
CN802, 803	RJS1A5009	CONNECTOR(9P)	
CN804	RJS1A5115	CONNECTOR(15P)	
CN805	RJS5T4ZA	CONNECTOR(5P)	
CN806	RHR193ZA	CONNECTOR(5P)	
CN808	RJS3T4ZA	CONNECTOR(3P)	
CN901, 902	RJJ93MS02	ANALOG IN TERMINAL	
CN903, 904	RJJ93MS01	ANALOG OUT TERMINAL	
CN905	RJJ93MS02	AES/EBU IN TERMINAL	
CN906	RJJ93MS01	AES/EBU OUT TERMINAL	
CN907	SJF3057-7A-1	IEC TYPE2 IN/OUT TERMINAL	
CN911, 912	REZ0294A	CONNECTOR(6P)	
CN913	RHR190ZA	CONNECTOR(3P)	
CN1003	REE0295	CONNECTOR(10P)	
CN1003A	RHR199ZA	CONNECTOR(12P)	
CN1004	RHR191ZA	CONNECTOR(4P)	
		METER	
HM1002	RSE0001	HOUR METER	
		CONNECTOR ASS'Y	
JCN1	RWJ0710130QQ	CONNECTOR ASS'Y(10P)	
JCN3	RWJ0710110QQ	CONNECTOR ASS'Y(10P)	
JCN5	RWJ0706200QQ	CONNECTOR ASS'Y(6P)	
JCN8	RWJ1006400KQ	CONNECTOR ASS'Y(6P)	
JCN9	REZ0121A	CONNECTOR ASS'Y(6P)	
JCN16	RWJ0705110QQ	CONNECTOR ASS'Y(5P)	
JCN30	RWJ1005310KQ	CONNECTOR ASS'Y(5P)	
JCN42	REZ0125A	CONNECTOR ASS'Y(10P)	
JCN45	REZ0126A	CONNECTOR ASS'Y(5P)	
JCN56	REZ0127A	CONNECTOR ASS'Y(6P)	
JCN67	RWJ0703230QQ	CONNECTOR ASS'Y(3P)	
JCN70	REZ0138A-1	CONNECTOR ASS'Y(2P)	
JCN806	RWJ0705230QQ	CONNECTOR ASS'Y(5P)	
JCN913	RWJ0703230QQ	CONNECTOR ASS'Y(3P)	
JCN1003	RWJ0710150QQ	CONNECTOR ASS'Y(10P)	
JCN1003A	RWJ0712120QQ	CONNECTOR ASS'Y(12P)	
JCN1004	RWJ0704150QQ	CONNECTOR ASS'Y(4P)	
		RELAY(S)	
RLY401	AG80239	RELAY	
RLY901, 902	AG80239	RELAY	

■ EXPLODED VIEWS

- **Cabinet and chassis parts**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20
23×2
N10
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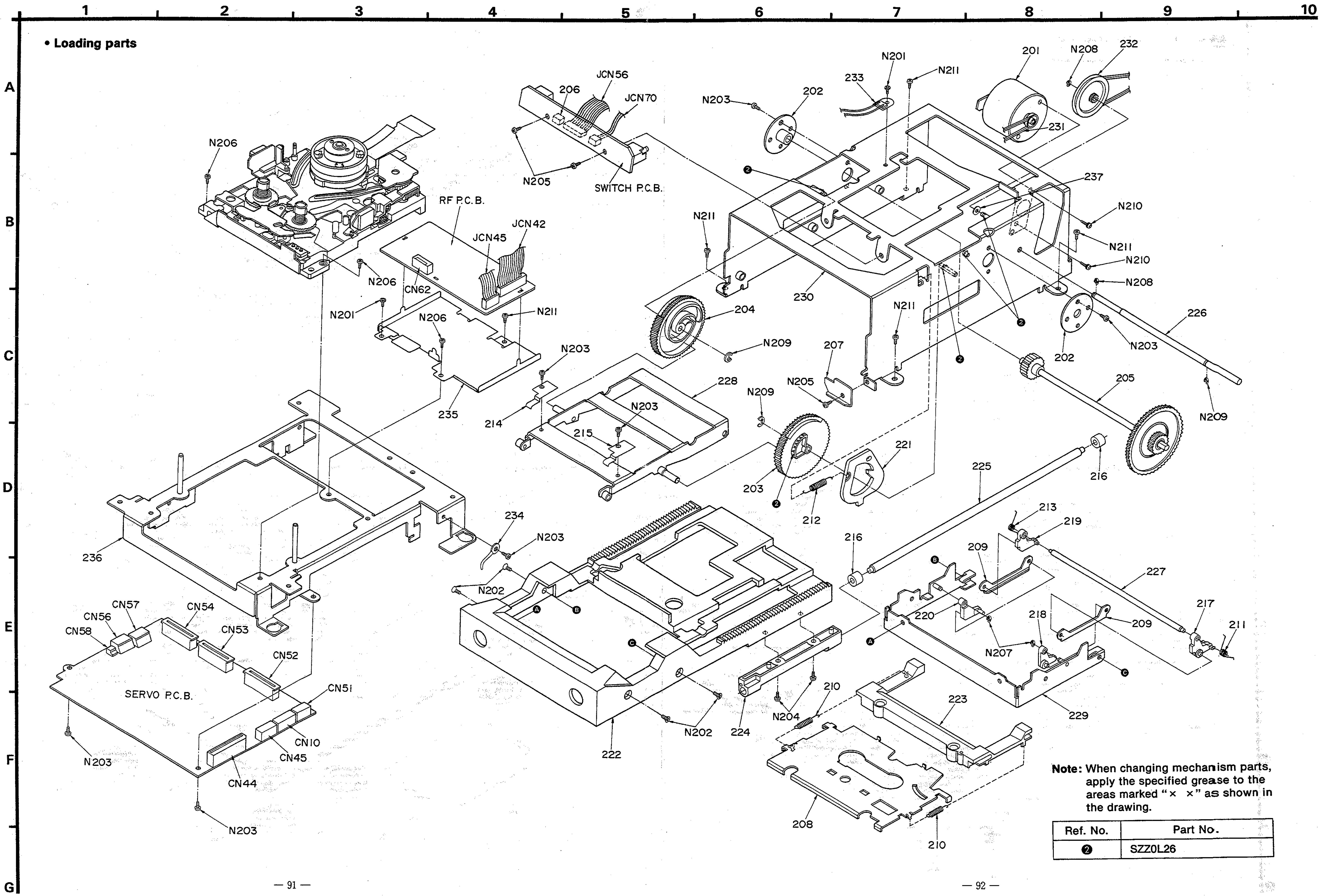
23×2
VOLTAGE ADJ. P.C.B
N22
N22
CN802
CN803
CN801
AC IN P.C.B.
CN805
N22
JCN806
CN806
CN808
SK801
CN804
JK1
28
INTERFACE P.C.B.
N21
N21
N21
N7
N4
N7
N6
N6
N6
N4
N6
10
36
PARALLEL REMOTE P.C.B.
JK1002
CN907
CN1003A
JCN1003A
3
N9
35
DIGITAL IN/OUT TERMINAL P.C.B.
CN906
CN905
JCN913
CN913
JCN1004
CN1004
JCN1
CN1003
JCN1003
CN1
OUTPUT LEVEL P.C.B.
CN903
CN904
CN901
CN902
CN912
CN911
ANALOG IN/OUT TERMINAL P.C.B.
POWER TRANSFORMER P.C.B.
31
N1
CN67
JCN67
34
REGULATOR P.C.B.
CN4
1
N5
CN41
CN23
CN28
CN6
CN13
CN12
CN11
CN43
CN29
CN26
CN21
MAIN P.C.B.
CN18
2
N5
N19
N8
N16
9
N18
CN2
JCN9
27
CN7
JCN5
CN5
POWER SUPPLY P.C.B.
CN3
JCN3
29
N1
N8
N13
30
14
8
N8
18
19
24
N4
N20
4
5
OPERATION P.C.B.
JCN30
JCN8
N20
POWER SWITCH P.C.B.
N17
11
32
34
N17
HEADPHONES JACK P.C.B.
12
CN22
33
N12
N1
34
JK550
13
21
N11
16
15
N15
17
N4
25
BALANCE/REC LEVEL P.C.B.
CN16
JCN16
N17
N15
22
N14
26
A
B

- **Loading parts**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JCN56
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JCN70
N205
SWITCH P.C.B.
RF P.C.B.
JCN42
JCN45
CN62
N206
N201
N206
N211
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CN57
CN56
CN58
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CN53
CN52
CN51
SERVO P.C.B.
CN10
CN45
CN44
N203
N203
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N202
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N207
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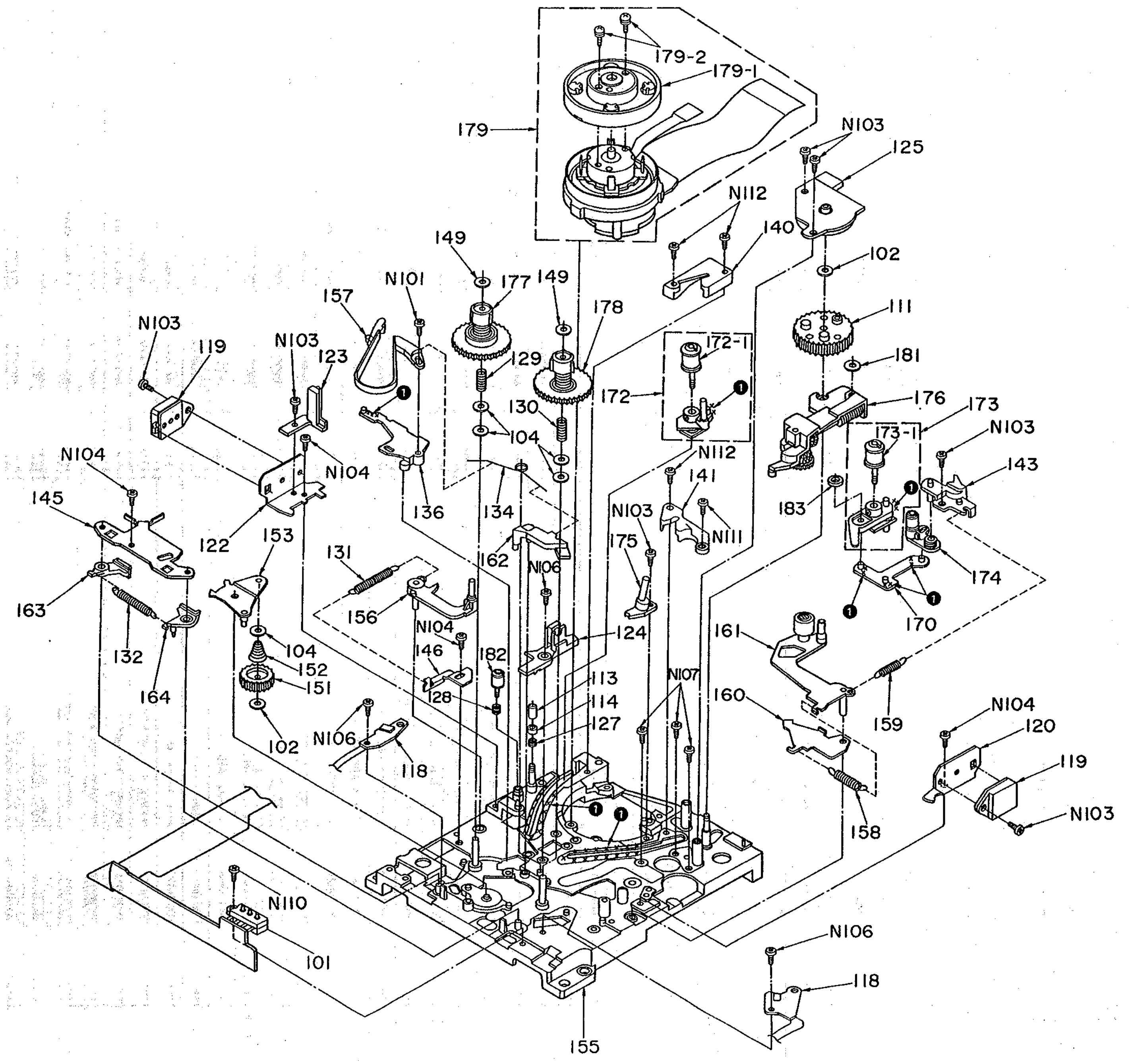
Note: When changing mechanism parts, apply the specified grease to the areas marked "× ×" as shown in the drawing.

Ref. No.	Part No.
❷	SZZ0L26

• Mechanism parts (RAA1001)

(Top view)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172-1
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N103
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173-1
N104
N104
N112
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N107
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N103
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N110
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N106
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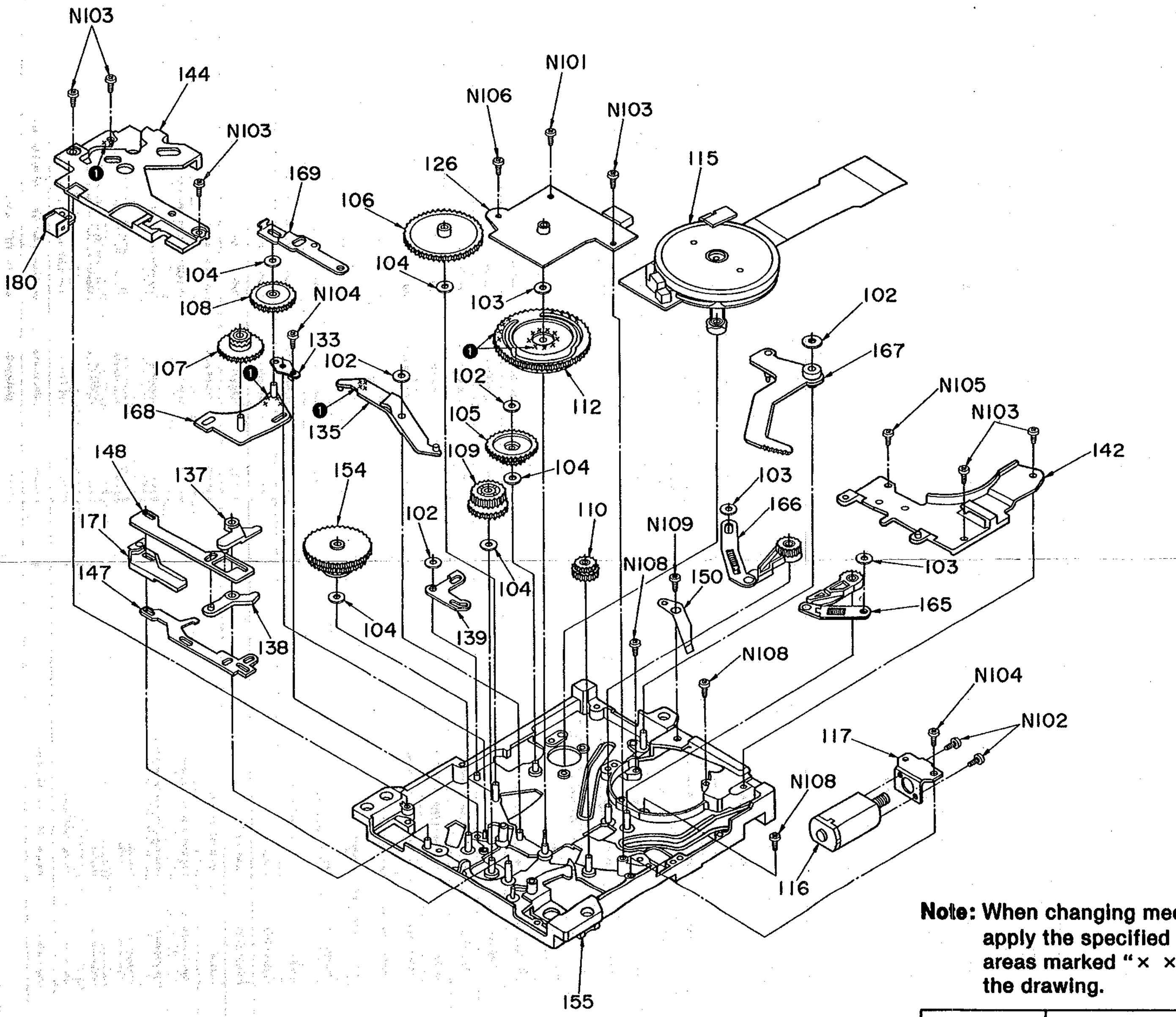
(Bottom view)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Note: When changing mechanism parts, apply the specified grease to the areas marked "× ×" as shown in the drawing.

Ref. No.	Part No.
❶	RZZ0L06

■ REPLACEMENT PARTS LIST

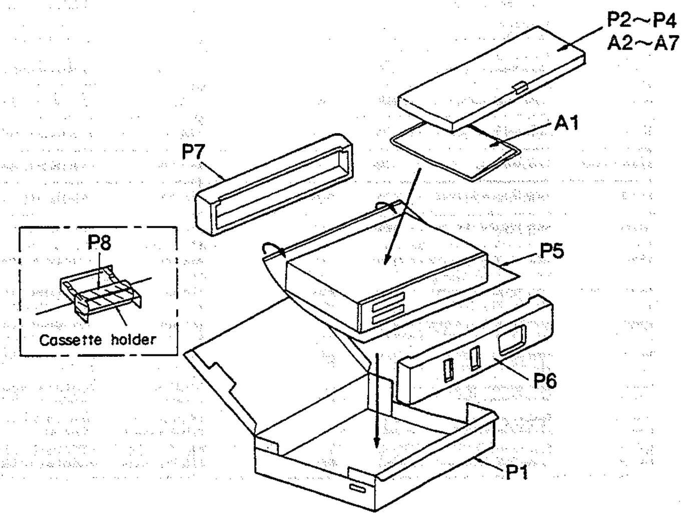
Notes : * Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
* The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)
Parts without these indications can be used for all areas.

Ref. No.	Part No.	Part Name & Description	Remarks
		CABINET AND CHASSIS	
1	RMY0030	RADIATOR	
2	SNE1004-1	GND PLATE	
3	SMN2080	EARTH PLATE	
4	RMA0202	FL HOLDER	
5	REZ0136A	CONNECTOR	
6	REZ0137A	CONNECTOR	
7	RGK0165A-H	TRAY ORNAMENT	
8	RGQ0059	CARD SPACER	
9	RGQ0046	WIRE SADDLE	
10	RFKHV3900EBH	REAR PANEL ASS'Y	(EB)
10	RFKHV3900EGH	REAR PANEL ASS'Y	(EG)
11	RGU0030A	BUTTON, POWER	
12	RGU0235-H	BUTTON, OPERATION A	
13	RGU0236A-H	BUTTON, OPERATION B	
14	SHE181	P. C. B. SUPPORT	
15	RGU0238	BUTTON, SWITCH	
16	RGV0033	KNOB, SAMPLING FREQUENCY	
17	RGW0055	KNOB, BALANCE/H. P. LEVEL	
18	RKA0009-K	FOOT	
19	RKF0089	HOLDER (SERVO P. C. B.)	
20	RKM0076-H	CABINET	
21	RMA0192	HOLDER (HEADPHONES)	
22	RMA0193	HOLDER (BALANCE/REC LEVEL)	
23	RMG0134	MECHANISM SUPPORT	
24	RMK0068-2	CHASSIS	
25	RFKGV3900PPH	FRONT PANEL ASS'Y	
26	RYQ0049-1	KNOB, REC LEVEL	
27	SHE185-1	P. C. B. SUPPORT	
28	RMA0408	ANGLE	
29	RMY0047-1	RADIATOR	
30	RMC0117	EARTH PLATE	
31	RMZ0095-1	INSULATION SHEET (A)	
32	RMZ0096	INSULATION SHEET (B)	
33	SHR330	BINDER	
34	SHR9815	RIVET	
35	SJT347	FUSE HOLDER	
36	SJT345	HOUR METER HOLDER	
		SCREWS	
N1	XTB3+8J	SCREW	
N2	SHDD4-1	SCREW	
N3	SNE2095-5	SCREW	
N4	XTBS3+8JFZ1	SCREW	
N5	XTB3+16JFR	SCREW	
N6	XSN26+4FZ	SCREW	
N7	XTBS3+8FFZ1	SCREW	
N8	XTV3+6G	SCREW	
N9	XTW3+6T	SCREW	
N10	XVE3A4FP	SCREW	
N11	XNS12	NUT	
N12	XNS7S	NUT	
N13	XTB3+6F	SCREW	
N14	XNS9	NUT	
N15	XWC3B	WASHER	
N16	XWC4B	WASHER	
N17	XTB3+8GFR	SCREW	
N18	XYA3+CJ16FR	SCREW	
N19	XTB4+8F	SCREW	
N20	XTB3+10GFR	SCREW	
N21	XSB3+8	SCREW	
N22	XTB3+20JFR	SCREW	
		MECHANISM PARTS	
101	EVQWR4002	CASSETTE SW.	
102	QBW2008	WASHER	
103	QBW2030	WASHER	
104	QBW2059	WASHER	
105	RDG0066-1	MAIN GEAR A	
106	RDG0067	MAIN GEAR B	
107	RDG0068	IDLER GEAR (P)	
108	RDG0069	IDLER GEAR (F)	
109	RDG0070	COUNTER GEAR	
110	RDG0073-1	MODE REPEATING GEAR	
111	RDK0006-1	LOAD CAM	
112	RDK0007-1	MODE CAM	
113	RDP0020	FIXED POST	
114	RDP0021	FIXED POST FLANGE	
115	REM0001	CAPSTAN UNIT	
116	REM0009	MODE MOTOR ASS'Y	
117	RMN0028	HOLDER, MODE MOTOR	
118	REQ0012	INTERFACE P. C. B.	
119	REQ0014	BEGIN/END DET. SENSOR ASS'Y	
120	RMN0030	BEGIN DET. ANGLE	
122	RMN0029	END DET. ANGLE	
123	RMQ0059	LEAD OPENER	
124	REQ0018	BEGIN/END DET. LED ASS'Y	
125	EVQWXN001	LOAD SW ASS'Y	
126	EVQWXM001	MODE SW ASS'Y	
127	RMB0061	SPRING, FIXED POST	
128	RMB0063	SPRING, GUIDE ROLLER	
129	RMB0071	SPRING, S. REEL	
130	RMB0073-1	SPRING, T. REEL	
131	RMB0074	SPRING, TENSION	
132	RMB0075	SPRING, BRAKE	
133	RMC0034	ANGLE	
134	RME0037-1	SPRING, BT	
135	RML0088	LEVER, PINCH	
136	RML0090	LEVER, TENSION	
137	RML0094	LEVER, S. BRAKE	
138	RML0095	LEVER, T. BRAKE	
139	RML0103	LEVER, LOAD SELECT	
140	RMQ0052	S. STOPPER	
141	RMQ0053	T. STOPPER	
142	RMQ0055	LOAD GUIDE HOLDER	
143	RMQ0056-1	GUIDE ARM STOPPER	
144	RMQ0058	MODE GUIDE PLATE	
145	RMQ0062	IDLER GUIDE	
146	RMQ0063	TENSION SPRING HOOK	
147	RMQ0064-1	S. BRAKE DRIVE PLATE	
148	RMQ0065-1	T. BRAKE DRIVE PLATE	
149	RNW172ZA	WASHER	
150	RUS740ZA	EARTH ANGLE	
151	RDG0071	IDLER GEAR	
152	RMB0069	IDLER SPRING	
153	RXL0051	IDLER ARM ASS'Y	
154	RXG0011-2	DRIVE GEAR	
155	RXK0019	CHASSIS UNIT	
156	RXL0035-4	TENSION ARM ASS'Y	
157	RXL0036	TENSION BAND ASS'Y	
158	RMB0066	PIN-PRESSURE SPRING	
159	RMB0067	PINCH ROLLER SPRING	
160	RMM0036	PIN-PRESSURE LINK	
161	RXL0046	PINCH ARM ASS'Y	
162	RXL0048	BT LEVER ASS'Y	
163	RXL0049	S. BRAKE ASS'Y	
164	RXL0050	T. BRAKE ASS'Y	
165	RXL0052-1	S. LOAD ARM	
166	RXL0054-1	T. LOAD ARM	
167	RXL0056-2	LOAD LEVER	
168	RXL0057	P. F. IDLER ASS'Y	
169	RXL0058	LEVER, P. F. SELECTION	
170	RXM0018	GUIDE LINK ASS'Y	
171	RXM0019	PLUNGER LINK ASS'Y	
172	RXP0016-2	S. POST ROLLER ASS'Y	
172-1	RXP0008	POST ROLLER	
173	RXP0017-1	T. POST ROLLER ASS'Y	
173-1	RXP0008	POST ROLLER	
174	RXP0020-1	T. GUIDE ROLLER	
175	RXQ0057	T. INCLINED BASE ASS'Y	
176	RXQ0079-1	LOAD HOLDER ASS'Y	
177	RXR0006	S. REEL ASS'Y	
178	RXR0007	T. REEL ASS'Y	
179	VEG0752-1	CYLINDER UNIT	
179-1	VEH0460	UPPER CYLINDER	
179-2	VHD0593	SCREW	
180	RSJ0006	PLUNGER	
181	QBW2081A	WASHER	
182	RXP0031	GUIDE ROLLER	
183	RHW12009	GUIDE WASHER	
		SCREWS	
N101	QHQ1371	SCREW	
N102	XQN14+C16	SCREW	
N103	RHQ0014	SCREW	
N104	RHQ0007	SCREW	
N105	RHQ0015	SCREW	
N106	RHQ0016	SCREW	
N107	RHQ0017	SCREW	
N108	XQN16+A45T	SCREW	
N109	XQN2+A2	SCREW	
N110	RHQ0018	SCREW	
N111	RHQ0019	SCREW	
N112	RHQ0020	SCREW	
		LOADING PARTS	
201	RFKPVDA10-K	MOTOR ASS'Y	
202	RDB0032	HOLDER, GEAR SHAFT	
203	RDG0120-2	MAIN GEAR	
204	RDG0122-1	MAIN GEAR	
205	RFKNVDA10BK	GEAR SHAFT ASS'Y	
206	RJP2G27ZA	CONNECTOR (CN72)	
207	RMA0194	SHAFT FRAME	
208	RMA0486	ANGLE, CASSETTE HOLDER	
209	RMA0200	HOLDER ARM	
210	RMB0110	SPRING	
211	RMB0111	SPRING	
212	RMB0131	SPRING	
213	RMB0144	SPRING	
214	RMC0050-1	ANGLE	
215	RMC0051-1	ANGLE	
216	RMG0090	RUBBER	
217	RML0139-1	HOLDER, SHAFT	
218	RML0140-1	HOLDER	
219	RML0141-1	HOLDER, SHAFT	
220	RML0142-1	HOLDER	
221	RML0150-1	HOLDER, MAIN GEAR	
222	RMR0206-H	TRAY	
223	RMR0207-H	CASSETTE HOLDER	
224	RMR0209-1	SHAFT ANGLE	
225	RMS0158-1	SHAFT	
226	RMS0160	SHAFT	

Ref. No.	Part No.	Part Name & Description	Remarks
227	RMS0165	SHAFT	
228	RXA0046	SUB FRAME	
229	RXA0047	CASSETTE HOLDER	
230	RXK0059	FRAME	
231	SMQ20025	BELT	
232	SMQ40032	PULLY GEAR	
233	EYHS78R	DEW SENSOR	
234	SHE36-3	EARTH TERMINAL	
235	RSC0066	SHIELD PLATE	
236	RXA0060	MECHANISM FRAME	
237	RMX0044	WASHER	
		SCREWS	
N201	XSN2+3	SCREW	
N202	XSS26+4FZ	SCREW	
N203	XTB3+6J	SCREW	
N204	XTN3+10G	SCREW	
N205	XTN3+6B	SCREW	
N206	XTN3+8F	SCREW	
N207	XUC15FT	WASHER	
N208	XUC2FT	WASHER	
N209	XUC3FT	WASHER	
N210	XYN26+C33	SCREW	
N211	XTB3+6F	SCREW	
		PACKING MATERIAL	
P1	RPG0936	PACKING CASE	
P2	RPN0391-1	PAD	
P3	RPN0392	PAD	
P4	XZB09X10C03	PROTECTION BAG (SCREW)	
P5	RPF0017	PROTECTION BAG (UNIT)	
P6	RPN0221	PAD (FRONT)	
P7	RPN0222	PAD (BACK)	
P8	RPH0065-1	TRAY COVER	
		ACCESSORIES	
A1	RQF1179	INSTRUCTION MANUAL	
A2	SJPD19-1E	COAXIAL CABLE	
A3	SJAD8	AC POWER SUPPLY CORD	⚠ (EB)
A3	RJA0003-K	AC POWER SUPPLY CORD	⚠ (EG)
A4	RYQ0059-1	RACK MOUNT KIT	
A5	RYQ0060-1	RACK MOUNT KIT	
A6	XYN3+F10FZ	SCREW	
A7	RT-RCLP	CLEANING TAPE	
		〈PRINTED CIRCUIT	
		BOARDS ASS' Y〉	
PCB1	REP0814D	MAIN P. C. B. ASS' Y	(NLA)
PCB1-1	RFKBV3900EBA	PARALLEL REMOTE P. C. B.	(NLA)
		DIGITAL TERMINAL P. C. B.	(NLA)
		AC IN P. C. B.	(NLA)
		POWER SWITCH P. C. B.	(NLA)
		POWER TRANSFORMER P. C. B.	(NLA)
		ANALOG TERMINAL P. C. B.	(NLA)
		BALANCE/REC LEVEL P. C. B.	(NLA)
		OUTPUT LEVEL P. C. B.	(NLA)
		VOLTAGE ADJ. P. C. B.	(NLA)
PCB1-2	RFKBV3900EBI	MAIN P. C. B.	(NLA)
PCB2	REP0693B	REGULATOR IC P. C. B.	(NLA)
		POWER SUPPLY P. C. B.	(NLA)
PCB3	REP0694B	OPERATION P. C. B.	(NLA)
		HEADPHONES JACK P. C. B.	(NLA)
PCB4	REP0417A	RF P. C. B., SERVO P. C. B. ASS' Y	(NLA)
PCB4-1	RFKBV3700-N	RF P. C. B.	(NLA)
PCB4-2	RFKBV3700-0	SERVO P. C. B.	(NLA)
PCB5	REP0421A	TRAY MOTOR P. C. B.	(NLA)
		SWITCH P. C. B.	(NLA)
PCB6	REQ0012	CONNECTOR P. C. B.	(NLA)
PCB7	REP0737A	INTERFACE P. C. B.	(NLA)
		〈MECHANISM ASS' Y〉	
MECH1	RAA1001	MECHANISM UNIT	(NLA)

Note: Printed circuit board assembly and mechanism assembly with mark (NLA) is no longer available after discontinuation of the product.

■ PACKING



RESISTORS & CAPACITORS

Notes : * Capacity valuse are in microfarads (uF) unless specified otherwise, P=Pico-farads(pF) F=Farads(F)
* Resistance values are in ohms, unless specified otherwise, 1K=1,000(OHM) , 1M=1,000k(OHM)

Ref. No.	Part No.	Values & Remarks
		RESISTORS
R11	ERDS2TJ392T	1/4W 3.9K
R12	ERD25FJ102	1/4W 1K ⚠
R13, 14	ERG1ANJP560S	1W 56
R101, 102	ERJ6GEYJ221V	1/10W 220
R103, 104	ERJ6GEYJ681V	1/10W 680
R112, 113	ERJ6GEYJ332V	1/10W 3.3K
R115	ERJ6GEYJ332V	1/10W 3.3K
R117	ERJ6GEYJ102V	1/10W 1K
R118	ERJ6GEYJ471V	1/10W 470
R123	ERJ6GEYJ822V	1/10W 8.2K
R124	ERJ6GEYJ152V	1/10W 1.5K
R126	ERJ6GEYJ152V	1/10W 1.5K
R128	ERJ6GEYJ822V	1/10W 8.2K
R131	ERJ6GEYJ331V	1/10W 330
R132, 133	ERJ6GEYJ221V	1/10W 220
R134	ERJ6GEYJ102V	1/10W 1K
R135, 136	ERJ6GEYJ471V	1/10W 470
R150	ERJ6GEYJ102V	1/10W 1K
R151, 152	ERJ6GEYJ471V	1/10W 470
R153	ERJ6GEYJ223V	1/10W 22K
R154, 155	ERJ6GEYJ471V	1/10W 470
R156, 157	ERJ6GEYJ222V	1/10W 2.2K
R158	ERJ6GEYJ102V	1/10W 1K
R159	ERJ6GEYJ223V	1/10W 22K
R160	ERJ6GEYJ221V	1/10W 220
R162	ERJ6GEYJ472V	1/10W 4.7K
R164, 165	ERJ6GEYJ472V	1/10W 4.7K
R167	ERJ6GEYJ332V	1/10W 3.3K
R168	ERJ6GEYJ102V	1/10W 1K
R169	ERJ6GEYJ471V	1/10W 470
R172	ERJ6GEYJ102V	1/10W 1K
R173, 174	ERJ6GEYJ222V	1/10W 2.2K
R175	ERJ6GEYJ151V	1/10W 150
R176	ERJ6GEYJ104V	1/10W 100K
R178	ERJ6GEYJ820V	1/10W 82
R181	ERJ6GEYJ331V	1/10W 330
R193-195	ERJ6GEYJ102V	1/10W 1K
R196	ERJ6GEYJ103V	1/10W 10K
R197	ERJ6GEYJ102V	1/10W 1K
R201	ERJ6GEYJ102V	1/10W 1K
R202, 203	ERJ6GEYJ223V	1/10W 22K
R204	ERJ6GEYJ103V	1/10W 10K
R205	ERJ6GEYJ683V	1/10W 68K
R206	ERJ6GEYJ684V	1/10W 680K
R207	ERJ6GEYJ472V	1/10W 4.7K
R208	ERJ6GEYJ683V	1/10W 68K
R209	ERJ6GEYJ153V	1/10W 15K
R210	ERJ6GEYJ102V	1/10W 1K
R212	ERJ6GEYJ105	1/10W 1M
R213	ERJ6GEYJ274V	1/10W 270K
R214	ERJ6GEYJ682V	1/10W 6.8K
R215	ERJ6GEYJ184V	1/10W 180K
R216	ERJ6GEYJ101V	1/10W 100
R217, 218	ERJ6GEYJ472V	1/10W 4.7K
R219, 220	ERJ6GEYJ103V	1/10W 10K
R221, 222	ERJ6GEYJ474V	1/10W 470K
R223, 224	ERJ6GEYJ222V	1/10W 2.2K
R225, 226	ERJ6GEYJ184V	1/10W 180K
R227	ERJ6GEYJ102V	1/10W 1K
R228	ERJ6GEYJ222V	1/10W 2.2K
R229	ERJ6GEYJ103V	1/10W 10K
R230	ERJ6GEYJ681V	1/10W 680
R231	ERJ6GEYJ821V	1/10W 820
R232	ERJ6GEYJ333V	1/10W 33K
R233	ERJ6GEYJ393V	1/10W 39K
R234	ERJ6GEYJ333V	1/10W 33K
R235	ERJ6GEYJ473V	1/10W 47K
R236	ERJ6GEYJ332V	1/10W 3.3K
R237	ERX12SJR33E	1/2W 0.33
R240	ERJ6GEYJ151V	1/10W 150
R241	ERJ6GEYJ333V	1/10W 33K
R242	ERJ6GEYJ103V	1/10W 10K
R243	ERJ6GEYJ473V	1/10W 47K
R244	ERJ6GEYJ102V	1/10W 1K
R245	ERX12SJR33E	1/2W 0.33
R247	ERJ6GEYJ331V	1/10W 330
R248	ERJ6GEYJ822V	1/10W 8.2K
R249	ERJ6GEYJ472V	1/10W 4.7K
R250	ERJ6GEYJ153V	1/10W 15K
R251	ERJ6GEYJ104V	1/10W 100K
R271, 272	ERJ6GEYJ103V	1/10W 10K
R273	ERJ6GEYJ681V	1/10W 680
R274	ERSB39JR82U	1/4W 0.82
R275	ERJ6GEYJ473V	1/10W 47K
R277, 278	ERJ6GEYJ333V	1/10W 33K
R279	ERJ6GEYJ683V	1/10W 68K
R280	ERJ6GEYJ333V	1/10W 33K
R281	ERJ6GEYJ332V	1/10W 3.3K
R282	ERJ6GEYJ682V	1/10W 6.8K
R284	ERJ6GEYJ103V	1/10W 10K
R285	ERJ6GEYJ104V	1/10W 100K
R286	ERJ6GEYJ103V	1/10W 10K
R287	ERJ6GEYJ684V	1/10W 680K
R289, 290	ERJ6GEYJ473V	1/10W 47K
R292, 293	ERJ6GEYJ563V	1/10W 56K
R294-296	ERJ6GEYJ473V	1/10W 47K
R297	ERJ6GEYJ220	1/10W 22
R298	ERJ6GEYJ473V	1/10W 47K
R301-306	ERJ6GEYJ332V	1/10W 3.3K
R309-312	ERJ6GEYJ332V	1/10W 3.3K
R313	ERJ6GEYJ331V	1/10W 330
R314-320	ERJ6GEYJ561V	1/10W 560
R321	ERJ6GEYJ331V	1/10W 330
R322	ERJ6GEYJ561V	1/10W 560
R323	ERJ6GEYJ473V	1/10W 47K
R324	ERJ6GEYJ331V	1/10W 330
R325	ERJ6GEYJ561V	1/10W 560
R326	ERJ6GEYJ332V	1/10W 3.3K
R331-333	ERJ6GEYJ105	1/10W 1M
R334-336	ERJ6GEYJ561V	1/10W 560
R337-339	ERJ6GEYJ102V	1/10W 1K
R340	ERJ6GEYJ332V	1/10W 3.3K
R341	ERJ6GEYJ561V	1/10W 560
R342	ERJ6GEYJ103V	1/10W 10K
R343	ERJ6GEYJ331V	1/10W 330
R344	ERJ6GEYJ223V	1/10W 22K
R351, 352	RRJ6GCAD822T	1/10W 8.2K
R354	RRJ6GCAD822T	1/10W 8.2K
R355	ERJ6GEYJ102V	1/10W 1K
R356-358	ERJ6GEYJ103V	1/10W 10K
R359	ERJ6GEYJ102V	1/10W 1K
R360	RRJ6GCAD183T	1/10W 18K
R361	RRJ6GCAD153T	1/10W 15K
R362	ERJ6GEYJ331V	1/10W 330
R363	ERJ6GEYJ103V	1/10W 10K
R364	ERJ6GEYJ105	1/10W 1M
R365	ERJ6GEYJ331V	1/10W 330
R366	RRJ6GCAD683T	1/10W 68K
R367	ERJ6GEYJ331V	1/10W 330
R368	ERJ6GEYJ561V	1/10W 560
R409, 410	ERDAS3J102T	1/4W 1K
R411, 412	ERDAS3J273T	1/4W 27K
R413, 414	ERDAS3J472T	1/4W 4.7K
R415, 416	ERDAS3J273T	1/4W 27K
R417	ERJ6GEYJ331V	1/10W 330
R419, 420	ERJ6GEYJ331V	1/10W 330
R421-424	ERJ6GEYJ225V	1/10W 2.2M
R447	ERJ6GEYJ561V	1/10W 560
R500	ERJ6GEYJ102V	1/10W 1K
R503-508	ERJ6GEYJ102V	1/10W 1K
R509, 510	ERJ6GEYJ473V	1/10W 47K
R517-520	ERDAS3J472T	1/4W 4.7K
R521, 522	ERDS2TJ682T	1/4W 6.8K
R523, 524	ERDS2TJ103	1/4W 10K

Ref. No.	Part No.	Values & Remarks
R525, 526	ERDAS3J472T	1/4W 4.7K
R527, 528	ERDAS3J332T	1/4W 3.3K
R529, 530	ERDAS3J152T	1/4W 1.5K
R531-534	ERDAS3J332T	1/4W 3.3K
R535, 536	ERDAS3J152T	1/4W 1.5K
R537, 538	ERJ6GEYJ105	1/10W 1M
R569-572	ERJ6GEYJ124V	1/10W 120K
R575, 576	ERDS2TJ102	1/4W 1K
R577	ERDAS3J332T	1/4W 3.3K
R577A	ERDS2TJ103	1/4W 10K
R578	ERDAS3J332T	1/4W 3.3K
R578A	ERDS2TJ103	1/4W 10K
R579	ERDAS3J332T	1/4W 3.3K
R579A	ERDS2TJ123	1/4W 12K
R580	ERDAS3J332T	1/4W 3.3K
R580A	ERDS2TJ123	1/4W 12K
R581A	ERDS2TJ104	1/4W 100K
R581	ERJ6GEYJ472V	1/10W 4.7K
R582A	ERDS2TJ104	1/4W 100K
R582	ERJ6GEYJ472V	1/10W 4.7K
R583A	ERDAS3G100T	1/4W 10
R583	ERJ6GEYJ472V	1/10W 4.7K
R584A	ERDAS3G100T	1/4W 10
R584	ERJ6GEYJ472V	1/10W 4.7K
R585A	ERDAS3G330T	1/4W 33
R585	ERJ6GEYJ472V	1/10W 4.7K
R586A	ERDAS3G330T	1/4W 33
R586	ERJ6GEYJ472V	1/10W 4.7K
R587A	ERDAS3G332T	1/4W 3.3K
R587	ERJ6GEYJ472V	1/10W 4.7K
R588A	ERDAS3G332T	1/4W 3.3K
R588	ERJ6GEYJ472V	1/10W 4.7K
R589, 590	ERDAS3G102T	1/4W 1K
R591, 592	ERDS2EJ121	1/4W 120
R593-596	ERDS2TJ222	1/4W 2.2K
R601-604	ERDS2TJ472	1/4W 4.7K
R605	ERDS2TJ100	1/4W 10
R606-608	ERDS2TJ102	1/4W 1K
R610, 611	ERDS2TJ471	1/4W 470
R612	ERDS2TJ102	1/4W 1K
R613-619	ERDS2TJ103	1/4W 10K
R620	ERDS2TJ471	1/4W 470
R621	ERDS2TJ105T	1/4W 1M
R801-820	ERDS2TJ472	1/4W 4.7K
R821	ERDS2TJ105T	1/4W 1M
R825-831	ERDS2TJ472	1/4W 4.7K
R901-904	ERDAS3J392T	1/4W 3.9K
R905-908	ERDAS3J102T	1/4W 1K
R909-912	ERDAS3J392T	1/4W 3.9K
R913-920	ERDAS3J332T	1/4W 3.3K
R921, 922	ERDAS3J102T	1/4W 1K
R923, 924	ERD25FJ331	1/4W 330 ⚠

Ref. No.	Part No.	Values & Remarks
R925, 926	ERJ6GEYJ105	1/10W 1M
R927, 928	ERDAS3J332T	1/4W 3.3K
R929, 930	ERDAS3J562T	1/4W 5.6K
R931-938	EROS2TKF1002	1/4W 10K
R939, 940	EROS2TKF3903	1/4W 390K
R941-944	EROS2TKF2002	1/4W 20K
R945, 946	ERDAS3J122T	1/4W 1.2K
R947, 948	EROS2TKF5103	1/4W 510K
R949, 950	EROS2TKF2202	1/4W 22K
R951-954	EROS2TKF75R0	1/4W 75.0
R955, 956	EROS2TKF5103	1/4W 510K
R957, 958	EROS2TKF2202	1/4W 22K
R959-962	ERDAS3J103T	1/4W 10K
R963, 964	ERJ6GEYJ473V	1/10W 47K
R965	ERDS2TJ221	1/4W 220
R967, 968	ERDAS3J472T	1/4W 4.7K
R969-972	ERDS2TJ331	1/4W 330
R973, 974	ERJ6GEYJ153V	1/10W 15K
R975, 976	ERJ6GEYJ101V	1/10W 100
R977	ERD25FJ101	1/4W 100 ⚠
R978, 979	ERJ6GEYJ330V	1/10W 33
R980	ERJ6GEYJ331V	1/10W 330
R981	ERJ6GEYJ334V	1/10W 330K
R982	ERJ6GEYJ473V	1/10W 47K
R983	ERJ6GEYJ332V	1/10W 3.3K
R984, 985	ERDS2TJ750	1/4W 75
R986	ERJ6GEYJ223V	1/10W 22K
R987-990	ERDAS3J392T	1/4W 3.9K
R991, 992	ERDAS3J101T	1/4W 100
R992A	ERJ6GEYJ100	1/10W 10
R993, 994	ERDAS3J101T	1/4W 100
R995, 996	ERJ6GEYJ473V	1/10W 47K
R997	ERJ6GEYJ223V	1/10W 22K
R998	ERJ6GEYJ101V	1/10W 100
R999	ERJ6GEYJ223V	1/10W 22K
R1021	ERJ6GEYJ272V	1/10W 2.7K
R1022	ERJ6GEYJ271V	1/10W 270
R1023	ERJ6GEYJ394V	1/10W 390K
		CAPACITORS
C1	ECKWKC103PF2	400V 0.01U ⚠
C11-19	ECKR1H103ZF5	50V 0.01U
C20	ECEA1EPZ332E	25V 3300U
C21	ECEA1CU100	16V 10U
C22	ECEA1EPZ332E	25V 3300U
C23	ECEA1CU100	16V 10U
C24	ECES1EU682G	25V 6800U
C25	ECEA1CU100	16V 10U
C26	ECEA1CU472E	16V 4700U
C27	ECEA1CU100	16V 10U
C28	ECEA1HU221B	50V 220U

Ref. No.	Part No.	Values & Remarks
C29	ECEA1VU330	35V 33U
C30, 31	ECKR1H103ZF5	50V 0.01U
C32	ECEA1EU470	25V 47U
C34	ECKR1H103ZF5	50V 0.01U
C79	ECKR1H103ZF5	50V 0.01U
C101, 102	ECUV1H222KBN	50V 2200P
C103, 104	ECUV1H471KCN	50V 470P
C105	ECUV1H470JCN	50V 47P
C107	ECUV1H222KBN	50V 2200P
C110	ECEA0JK221B	6.3V 220U
C123	ECUV1C105ZFM	16V 1U
C124, 125	ECUV1H472KBN	50V 4700P
C126, 127	ECUV1H470JCN	50V 47P
C129, 130	ECEA0JKS220B	6.3V 22U
C131	ECUV1H222KBN	50V 2200P
C150	ECUV1H471KCN	50V 470P
C151	ECUV1H222KBN	50V 2200P
C152	ECUV1H102KBN	50V 1000P
C154	ECUV1H220JCN	50V 22P
C155, 156	ECUV1H102KBN	50V 1000P
C157	ECUV1C105ZFM	16V 1U
C159	ECUV1H220JCN	50V 22P
C161	ECUV1H562KBN	50V 5600P
C163	ECUV1H562KBN	50V 5600P
C166	ECUV1E153MBN	25V 0.015U
C167	ECUV1H102KBN	50V 1000P
C168	ECUV1H270JCN	50V 27P
C169	ECUV1H100JCN	50V 10P
C171, 172	ECUV1H680JCN	50V 68P
C173	ECUV1H471KCN	50V 470P
C174	ECUV1E104MBN	25V 0.1U
C175	ECUV1H472KBN	50V 4700P
C176	ECUV1E333MDN	25V 0.033U
C177, 178	ECUV1H101KCN	50V 100P
C179	ECUV1E104MBN	25V 0.1U
C181	ECUV1C105ZFM	16V 1U
C185, 186	ECUV1H331KCN	50V 330P
C187	ECUV1H470JCN	50V 47P
C188	ECUV1H331KCN	50V 330P
C190	ECUV1H180JCN	50V 18P
C201	ECEA0JK470	6.3V 47U
C202	ECUV1E104ZFN	25V 0.1U
C203, 204	ECUV1H180JCN	50V 18P
C205, 206	ECUV1E104ZFN	25V 0.1U
C207	ECUV1H271KCN	50V 270P
C208	ECUV1H221KCN	50V 220P
C209, 210	ECUV1E104MBN	25V 0.1U
C211	ECUV1H221KCN	50V 220P
C212, 213	ECEA1CK220	16V 22U
C214, 215	ECUV1H101KCN	50V 100P
C216, 217	ECUV1C105ZFM	16V 1U
C218, 219	ECUV1H390KCN	50V 39P

Ref. No.	Part No.	Values & Remarks
C220, 221	ECUV1H121KCN	50V 120P
C222, 223	ECUV1C105ZFM	16V 1U
C224	ECQV1H683JZ3	50V 0.68U
C225, 226	ECUV1H332MBN	50V 3300P
C227	ECUV1E333MDN	25V 0.033U
C228	ECUV1H181KCN	50V 180P
C229	ECEA0JK221B	6.3V 220U
C230	ECEA0JK470	6.3V 47U
C231	ECEA1AU470	10V 47U
C232	ECEA1CK220	16V 22U
C233	ECUV1E104ZFN	25V 0.1U
C234	ECEA1CK470	16V 47U
C235, 236	ECUV1E104ZFN	25V 0.1U
C237	ECUV1C105ZFM	16V 1U
C238	ECUV1E223MBN	25V 0.022U
C239	ECUV1E683MBN	25V 0.068U
C240	ECUV1E153MBN	25V 0.015U
C241	ECUV1E104MBN	25V 0.1U
C242-246	ECUV1E104ZFN	25V 0.1U
C247, 248	ECUV1E333MDN	25V 0.033U
C249	ECUV1E153MBN	25V 0.015U
C250	ECUV1E104MBN	25V 0.1U
C251-253	ECUV1E104ZFN	25V 0.1U
C260	ECUV1E334ZFM	25V 0.33U
C268	ECUV1C105ZFM	16V 1U
C269	ECUV1E103KBN	25V 0.01U
C270	ECEA0JK470	6.3V 47U
C271	ECUV1E104ZFN	25V 0.1U
C272	ECUV1E223MBN	25V 0.022U
C273	ECUV1H101KCN	50V 100P
C274	ECUV1E103KBN	25V 0.01U
C275	ECUV1C105ZFM	16V 1U
C276	ECUV1H221KCN	50V 220P
C280	ECUV1C334ZFN	16V 0.33U
C301-307	ECUV1H103ZFN	50V 0.01U
C341	ECUV1E104ZFN	25V 0.1U
C342	ECUV1H103ZFN	50V 0.01U
C350	ECUV1H103ZFN	50V 0.01U
C351	ECUV1E473MBN	25V 0.047U
C352	ECUV1H820JCN	50V 82P
C353	ECUV1H471JCN	50V 470P
C354, 355	ECUV1H221JCN	50V 220P
C356	ECUV1H151JCN	50V 150P
C357	ECEA0JU330	6.3V 33U
C358-361	ECUV1H180JCN	50V 18P
C362, 363	ECUV1H150JCN	50V 15P
C364	ECUV1H050CCN	50V 5P
C365	ECUV1H102KBN	50V 1000P
C366	ECUV1H103ZFN	50V 0.01U
C367, 368	ECEA0JU330	6.3V 33U
C369	ECEA0JU221	6.3V 220U
C370	ECUV1H150JCN	50V 15P
C371	ECUV1E104ZFN	25V 0.1U
C372	ECEA0JU330	6.3V 33U
C373	ECUV1H103ZFN	50V 0.01U
C374	ECEA0JU330	6.3V 33U
C376	ECUV1E103KBN	25V 0.01U
C377, 378	ECUV1E223MBN	25V 0.022U
C379	ECUV1E104ZFN	25V 0.1U
C385	ECUV1H103ZFN	50V 0.01U
C389	ECUV1E104ZFN	25V 0.1U
C390	ECUV1H103ZFN	50V 0.01U
C391	ECUV1E103KBN	25V 0.01U
C392-395	ECUV1H103ZFN	50V 0.01U
C396	ECUV1H390JCN	50V 39P
C397	ECUV1H103ZFN	50V 0.01U
C401	ECUV1E104ZFN	25V 0.1U
C404, 405	ECUV1H220JCN	50V 22P
C407, 408	ECUV1H103ZFN	50V 0.01U
C411, 412	ECEA1CPZ470B	16V 47U
C425-430	ECUV1E104ZFN	25V 0.1U
C431, 432	ECEA0JPZ221B	6.3V 220U
C433, 434	ECQB1H272JZ	50V 2700P
C435	ECUV1E104ZFN	25V 0.1U
C438	ECEA0JU101B	6.3V 100U
C439, 440	ECEA1CU220	16V 22U
C500	ECUV1H102KBN	50V 1000P
C501, 502	ECHR1H271JZ3	50V 270P
C503, 504	ECUV1H103ZFN	50V 0.01U
C505, 506	ECHR1H103JZ3	50V 0.01U
C507, 508	ECEA1CU101	16V 100U
C509, 510	ECEA1CPZ101B	16V 100U
C511-514	ECEA0JPZ221B	6.3V 220U
C515-518	ECUV1H220JCN	50V 22P
C519, 520	ECEA1CU101	16V 100U
C521	ECUV1E104ZFN	25V 0.1U
C523, 524	ECUV1H103ZFN	50V 0.01U
C525	ECEA0JU101B	6.3V 100U
C526	ECUV1H103ZFN	50V 0.01U
C545, 546	ECUV1H220JCN	50V 22P
C547, 548	ECUV1H103ZFN	50V 0.01U
C549	ECUV1H470KCN	50V 47P
C550A	ECQV1H104JZ3	50V 0.1U
C550	ECUV1H470KCN	50V 47P
C551, 552	ECQV1H104JZ3	50V 0.1U
C553, 554	ECKT1H101KB	50V 100P
C555, 556	ECQV1H104JZ3	50V 0.1U
C561, 562	ECEA1CU220	16V 22U
C563, 564	ECEA1CN100SB	16V 10U
C602, 603	ECEA0JK470	6.3V 47U
C604, 605	ECBT1E103ZF	25V 0.01U
C652	ECBT1H102KB5	50V 1000P
C654	ECBT1H102KB5	50V 1000P
C655	ECEA1VK100B	35V 10U
C656	ECBT1H102KB5	50V 1000P
C657	ECEA0JK470	6.3V 47U
C658	ECBT1E103ZF	25V 0.01U
C659	ECEA1VK100B	35V 10U
C660	ECBT1E103ZF	25V 0.01U
C694	ECBT1E103ZF	25V 0.01U
C751	ECKW1H103ZF5	50V 0.01U
C801, 802	ECKR1H103ZF5	50V 0.01U
C802A	ECQV1H104JZ3	50V 0.1U
C803	ECKR1H103ZF5	50V 0.01U
C803A	ECQV1H104JZ3	50V 0.1U
C804	ECKR1H103ZF5	50V 0.01U
C804A	ECQV1H104JZ3	50V 0.1U
C805-813	ECKR1H103ZF5	50V 0.01U
C814	ECEA1CU220	16V 22U
C815, 816	ECCR1H470K5	50V 47P
C817	ECCR1H100K5	50V 10P
C818-820	ECKR1H103ZF5	50V 0.01U
C901-904	ECEA1CPZ470B	16V 47U
C905-912	ECUV1H220JCN	50V 22P
C913, 914	ECEA1CPZ470B	16V 47U
C915, 916	ECEA1CPZ101B	16V 100U
C917, 918	ECUV1H103ZFN	50V 0.01U
C919, 920	ECUV1H220JCN	50V 22P
C921-924	ECUV1H150JCN	50V 15P
C925-928	ECEA1CPZ221B	16V 220U
C929, 930	ECUV1H103ZFN	50V 0.01U
C931	ECEA0JU330	6.3V 33U
C932, 933	ECUV1E224ZFN	25V 0.22U
C934-937	ECUV1H470KCN	50V 47P
C938, 939	ECUV1E224ZFN	25V 0.22U
C940-942	ECUV1H103ZFN	50V 0.01U
C943	ECUV1H470KCN	50V 47P
C944	ECUV1H103ZFN	50V 0.01U
C945	ECKW1H103ZF5	50V 0.01U
C946	ECUV1H101KCN	50V 100P
C947-950	ECUV1H103ZFN	50V 0.01U
C953-960	ECHR1H221JZ3	50V 220P
C966	ECUV1H103ZFN	50V 0.01U
C990	ECUV1H103ZFN	50V 0.01U
C991, 992	ECEA1CU331	16V 330U
C995, 996	ECUV1H103ZFN	50V 0.01U
C1020-1028	ECUV1H103ZFN	50V 0.01U

Printed in Japan
H910101500 HH/TM

5393 1/32/1416

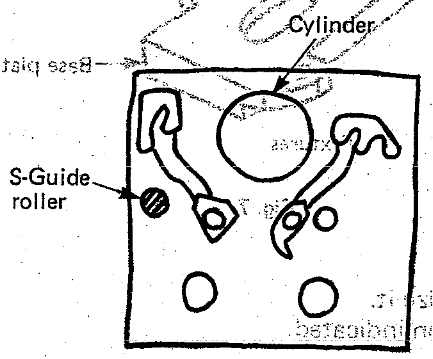
ORDER NO. AD9107188T5
D13

Technical Information

S-GUIDE POST ROLLER HEIGHT ADJUSTMENT PROCEDUR

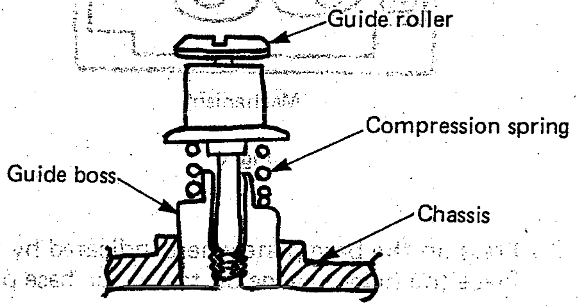
Model No. : SV-3700/SV-3900

1. Location Parts


Cylinder
S-Guide roller

Mechanism View

Fig. 1


Guide roller
Compression spring
Guide boss
Chassis

S-Guide Roller

Fig. 2

2. Remove the S-Guide Post Roller

(1) Remove the guide roller by turning it counterclockwise with a post roller adjustment driver. (See Fig. 3)
(2) Save the compression spring located under the post roller for reinstallation. (See Fig. 3)

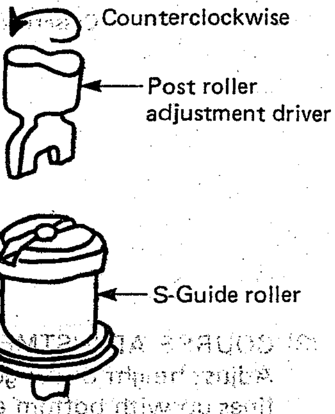

Counterclockwise
Post roller adjustment driver
S-Guide roller

Fig. 3

3. Installation of New Guide Roller

(1) Set compression spring from the previous step into the guide boss. (See Fig. 4)
(2) Install the new guide roller by turning it clockwise (Part No. RXP0027). (See Fig. 5)

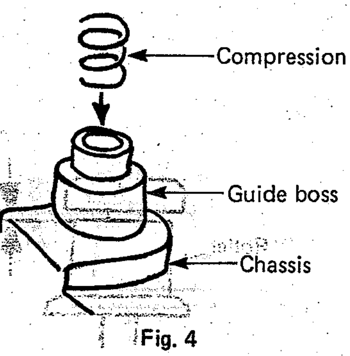

Compression spring
Guide boss
Chassis

Fig. 4

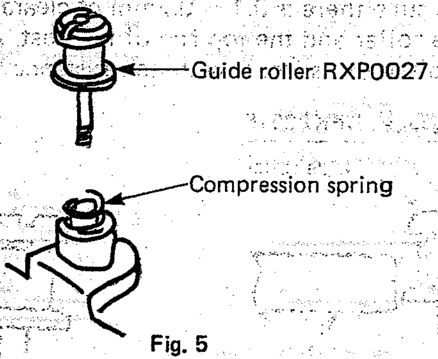

Guide roller RXP0027
Compression spring

Fig. 5

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4. S-Guide Roller Alignment Procedure

(1) The alignment fixture consists of 2 parts; the base plate and a height gauge. Set them on the mechanism chassis as shown.

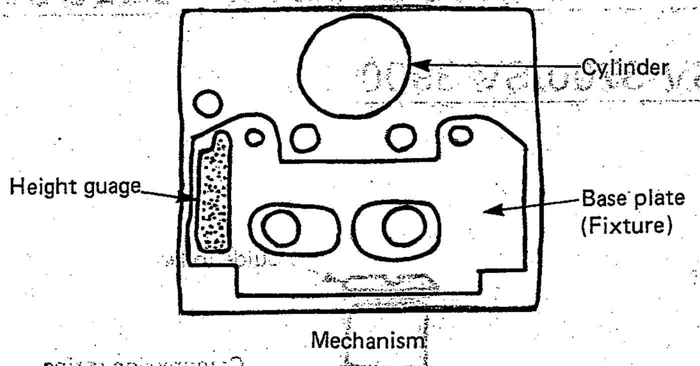
Cylinder
Height guage
Base plate
(Fixture)
Mechanism

Fig. 6

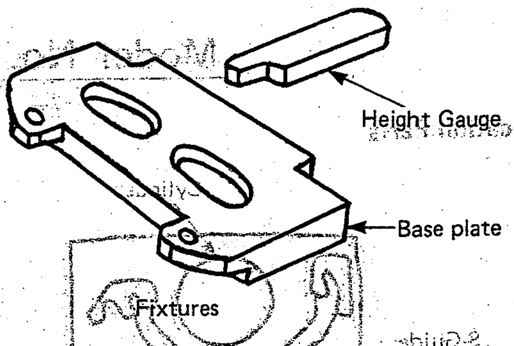
Height Gauge
Base plate
Fixtures

Fig. 7

(2) Press on the base plate where indicated by the "X" to stabilize it. Place the height gauge on top of the base plate in the position indicated.

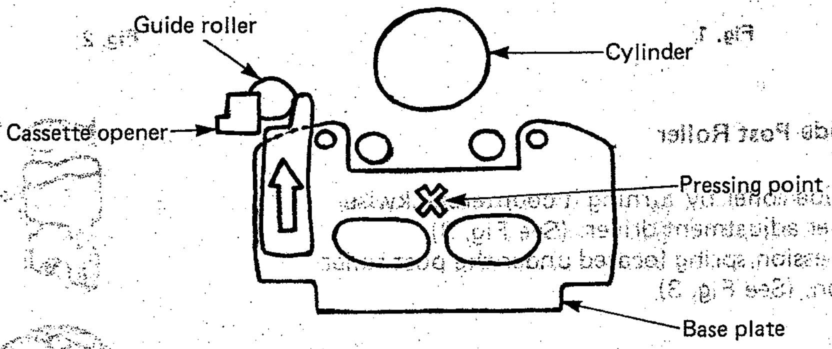
Guide roller
Cassette opener
Cylinder
Pressing point
Base plate

Fig. 8

(3) COURSE ADJUSTMENT
Adjust height of the guide roller so that the bottom rim lines up with bottom edge of the height gauge. (See Fig. 9)

(4) FINE ADJUSTMENT
Continue to turn the S-guide post clockwise until the surface of the lower flange is at the same level as the bottom surface of the height gauge. (See Fig. 10)

(5) Make sure there is 0.1 ~ 0.2mm of clearance between the white roller and the top rim of the post. Also be sure that the roller turns freely with no resistance. (See Fig. 11)

Height gauge: RFKZ0015

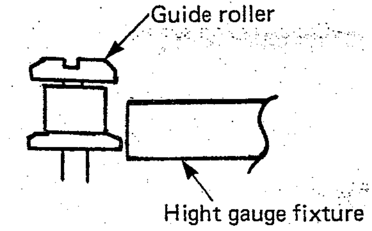
Guide roller
Hight gauge fixture

Fig. 9

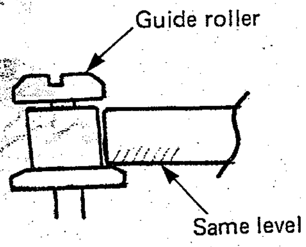
Guide roller
Same level

Fig. 10

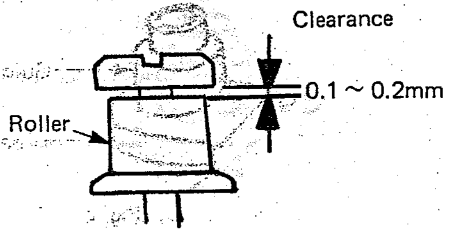
Clearance
0.1 ~ 0.2mm
Roller

Fig. 11

Height Gauge : RFKZ0015

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K910702800S.SUZUKI

ORDER NO. AD9503093S5
A0 8289

Service Manual

Supplement

Professional Digital Audio Tape Deck
SV-3900

Colour

(H)········Gray Type

Area

Suffix for Model No.	Area	Colour
(PP)	U.S.A./Canada.	(H)
(EB)	Great Britain./ Switzerland.	
(EG)	F.R. Germany & Italy./ Continental Europe.	

Please file and use this manual together with the service manual for Model No. SV-3900, Order No. AD9010279C1 (PP) and AD9101007C2 (EB, EG).

Note:
- This supplement is intended to provide additional information or corrections to the existing service manual for model No. SV-3900. Be sure to update your service manual for future reference.

Addition

■ REPLACEMENT PARTS LIST

Ref. No.	Change of Parts No.		Part Name & Description	Remarks
	ORIGINAL	**SUPPLEMENT**		
INTEGRATED CIRCUIT				
IC701	————	**0N2170QSL**	I.C, FG SENSOR	Addition
IC702	————	**0N2170QSL**	I.C, FG SENSOR	Addition
TRANSISTOR				
Q701	————	**REQ0014**	TRANSISTOR	Addition
Q702	————	**REQ0014**	TRANSISTOR	Addition
DIODE				
D701	————	**LN59**	DIODE	Addition

⚠ WARNING
This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

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Order No. VSD9806SK04
D13

Service Manual

Supplement

NTSC/PAL **DAT Product**

Subject : Change of OPEN/CLOSE Switch

Please use this supplement together with the Service Manual as follows :

Model No.	Bulletin No.	Order No.	Effective from
SV-3700PP-H	8	AD9007236C1	F8-----
SV-4100P-H	9	AD9407220C1	F8-----
SV-3800P-H	9	AD9511260C1	F8-----
SV-3900PP-H	9	AD9010279C1	F8-----
SV-3700EB/EG-H	5	AD9010314C2	F8-----
SV-4100EB/EG-H	6	AD9409253C2	F8-----
SV-3800E-H/EB-H	5	VSD9602MK01	F8-----
SV-3100EB-H/EG-H	6	AD9101007C2	F8-----

Reason for Change

☐ The following part(s) has(have) been changed for serviceability improvement.
☐ The following part(s) has(have) been changed for productivity improvement.
■ The following part(s) has(have) been changed for standardization.
☐ The following part(s) has (have) been changed for the safety regulation.
☐

Interchangeability Code (I/C)

A	Original or new parts may be used in early or late production set. Use original parts until exhausted, then stock new parts.
B	Original parts may be used in early production sets only. New parts may be used in early or late production sets. Use original parts possible then stock new parts.
C	New parts only may be used in early or late production sets.
D	Original parts may be used in early production sets only. New parts may be used in late production sets only. Stock both original and new parts.
E	Others

Part Number

Ref. No.	Original Part No.	New Part No.	Part Name & Descriptions	Pcs	I/C	Remarks
S751,752	SSPD18	VSS0566	SWITCH	2		

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P2 P9

Order No. VSD9806SK02
D13,A0

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Service Manual

Supplement

NTSC / PAL **DAT Product**

Subject : Addition of Tape Protectors

Please use this supplement together with the Service Manual as follows :

Model No.	Bulletin No.	Order No.	Effective from
SV-3700PP-H	7	AD9007236C1	E8----
SV-4100P-H	7	AD9407220C1	E8----
SV-3800P-H	8	AD9511260C1	E8----
SV-3900PP-H	8	AD9010279C1	E8----
SV-3700EB-H/EG-H	4	AD9010314C2	E8----
SV-4100EB-H/EG-H	4	AD9409253C2	E8----
SV-3800E-H/EB-H	4	VSD9602MK01	E8----
SV-3900EB-H/EG-H	5	AD9101007C2	E8----

Mechanism Part Section

Symptom : The deck dose not perform tape loading or reverse playback in the very low probability.

Cause : Tape loosing may occur in the case of loading completion and grease adheres to the tape.

Remedy :
1. To keep the proper tension of the guide arm, the guide arm spring has been changed as shown figure 1 on the reverse page.
2. To prevent tape loosing after completion of the tape loading, a washer has been added as shown in figure 1 on the reverse page.
3. To prevent any tape damage and grease adhesion to the tape, 3 pcs of tape protector have been added at the S. post, T. post and LED holder as shown on the reverse page.

Interchangeability Code (I/C)

A	Original or new parts may be used in early or late production set. Use original parts until exhausted, then stock new parts.
B	Original parts may be used in early production sets only. New parts may be used in early or late production sets. Use original parts possible then stock new parts.
C	New parts only may be used in early or late production sets.
D	Original parts may be used in early production sets only. New parts may be used in late production sets only. Stock both original and new parts.
E	Others

Part Number

Ref. No.	Original Part No.	New Part No.	Part Name & Descriptions	Pcs	I/C	Remarks
301	——	VMA0A51	S TAPE PROTECTOR	1	E	
302	——	VMA0A53	T. TAPE PROTECTOR	1	E	
303	——	VMA0A53	TAPE STOPPER	1	E	
304	——	VMB3276	GUIDE ARM SPRING	1	E	
305	——	XWGV2Z4G	WASHER	1	E	

TC2-0903

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Order No. VSD9806SK01
D13,A0

Service Manual

Supplement

NTSC/PAL

DAT Product

Subject : Tension Arm Adjustment Procedures

Please use this supplement together with the Service Manual as follows :

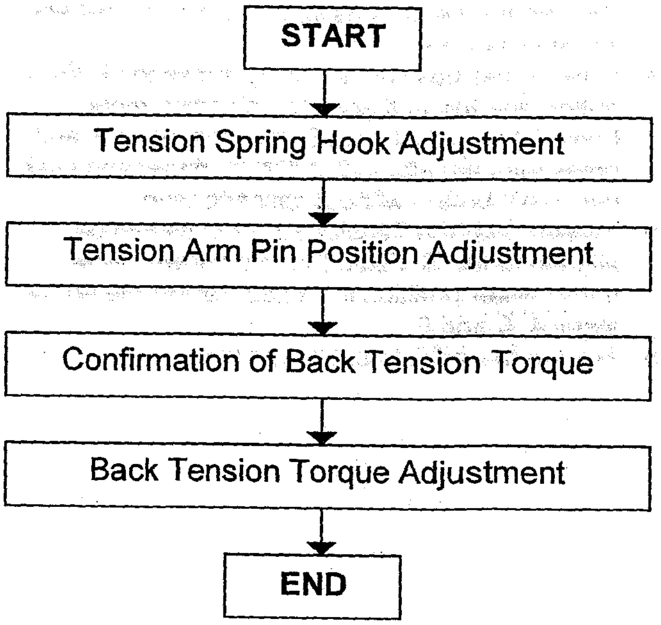
Model No.	Bulletin No.	Order No.	Effective from
SV-3700PP-H	6	AD9007236C1	First Product
SV-4100P-H	6	AD9407220C1	First Product
SV-3800P-H	7	AD9511220C1	First Product
SV-3900PP-H	7	AD9010279C1	First Product
SV-3700EB-H/EG-H	3	AD9010314C2	First Product
SV-4100EB-H/EG-H	3	AD9409253C2	First Product
SV-3800E-H/EB-H	3	VSD9602MK01	First Product
SV-3900EB-H/EG-H	4	AD9101007C2	First Product

1. Cassette Type Reel Torque Meter

To perform the Tension Arm Adjustment (Tape Tension) as the factory specification, Cassette Type Reel Torque Gauge (VFK1430 or TW-7131) is needed.
The VFK1430 has been introduced as replacement of TW-7131.

2. Tension Arm Adjustment

The following flow chart shows the Tension Arm Adjustment steps.


START
Tension Spring Hook Adjustment
Tension Arm Pin Position Adjustment
Confirmation of Back Tension Torque
Back Tension Torque Adjustment
END

TC2-0887,TC2-0872

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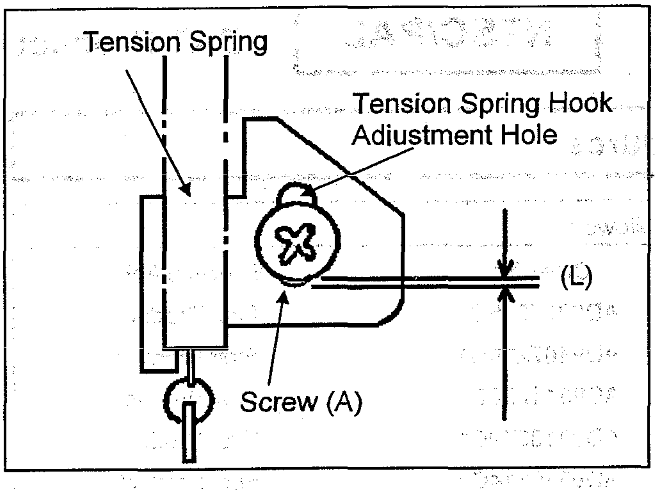
3. Tension Arm Adjustment Procedures

3-1. Tension Spring Hook Adjustment

1. Tighten the screw (A) so that the clearance (L) between Tension Spring Hook Adjustment hole and the screw (A) is 0 mm as shown in figure 1.

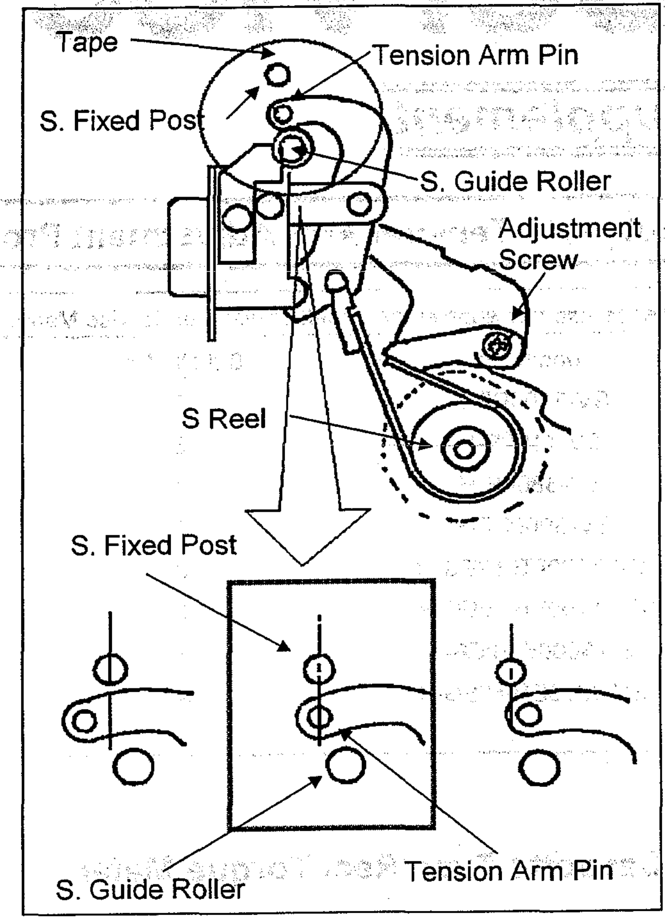

Tension Spring
Tension Spring Hook Adjustment Hole
(L)
Screw (A)

3-2. Tension Arm Pin Position Adjustment

1. Blind the End/Begin Detect Sensor by the black tape.
2. Press the cassette switch ON by finger and push the PLAY button without cassette tape. The unit goes to Loading mode.
3. Confirm the center position of S. Fixed Post and Tension Arm Pin.
4. If the center position is shifted, press the EJECT button and the unit goes to unloading mode.
5. Loosen the Adjustment Screw and adjust it and press the cassette switch ON by finger and push the PLAY button without cassette tape.
6. Confirm that the Tension Arm Pin should be aligned to the S. Fixed Post as shown below.
7. If the center position is shifted, repeat the above steps 4, 5 and 6.
8. Tighten the adjustment screw (A).

3-3. Confirmation of Back Tension Torque

1. Place the Cassette Type Torque Meter VFK1430 or TW-7131 on the recorder.
2. Place the recorder in the Playback mode so that the Torque Meter at the Supply Reel side indicates 5.5 ± 1.5 g.cm.


Tape
Tension Arm Pin
S. Fixed Post
S. Guide Roller
Adjustment Screw
S Reel
S. Fixed Post
S. Guide Roller
Tension Arm Pin

Tool	Torque Meter VFK1430 orTW-7131
Mode	Playback mode
Spec.	5.5 ± 1.5 g.cm (measured by Supply Reel)

3-4. Back Tension Torque Adjustment

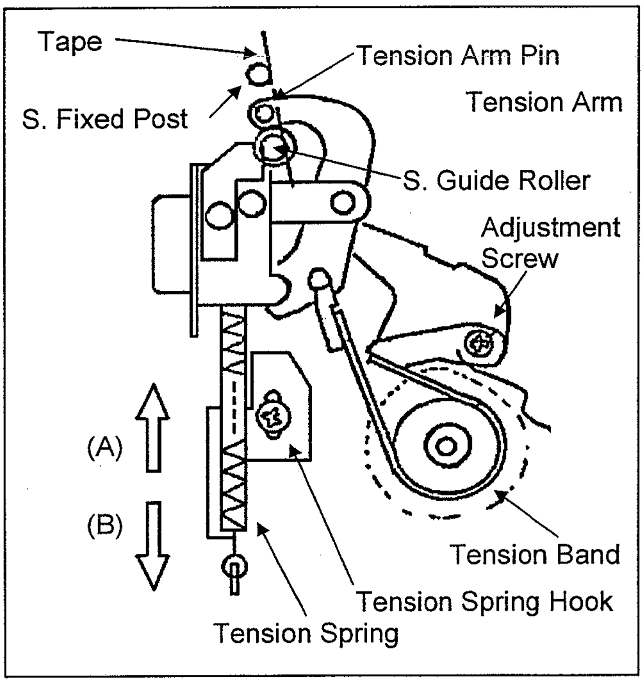
1. If the Back Tension torque is out of specification, the following adjustments are required.

< Back tension torque is more than specification >

1. Slide the Tension Spring Hook Plate to an arrow direction (A) and then confirm the Back Tension torque.

< Back tension torque is less than specification >

1. Slide the Tension Spring Hook Plate to an arrow direction (B) and then confirm the Back Tension torque.


Tape
Tension Arm Pin
Tension Arm
S. Fixed Post
S. Guide Roller
Adjustment Screw
(A)
(B)
Tension Band
Tension Spring Hook
Tension Spring